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PROCEEDINGS  
OF THE  
THIRD ANNUAL  
STATE SANITARY CONVENTION,

HELD UNDER THE AUSPICES OF THE  
CALIFORNIA STATE BOARD OF HEALTH

IN THE  
ACADEMY OF SCIENCES, SAN FRANCISCO.

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APRIL 15, 1895.



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OFFICE CALIFORNIA STATE BOARD OF HEALTH, }  
SACRAMENTO, May 15, 1895. }

*To his Excellency JAMES H. BUDD, Governor of California:*

SIR: I have the honor to present herewith the Proceedings of the Third Annual Sanitary Convention, held under the auspices of the California State Board of Health, at the Academy of Sciences, San Francisco, April 15, 1895.

Very respectfully,

J. R. LAINE,  
Secretary State Board of Health.



## PROGRAMME

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1. Convention called to order at 1:30 P. M. sharp.
2. Invocation, by Rev. ELBERT R. DILLE.
3. Address of Welcome, by Hon. ADOLPH SUTRO, Mayor of San Francisco.
4. Response, by Dr. C. A. RUGGLES, retiring President.
5. Election of officers—President, Vice-President, Secretary, and Committee on Publication—for ensuing year.
6. Address of President-elect.

### AFTERNOON SESSION.

7. "Street Sanitation." Dr. W. F. McNUTT.
8. "The Hospital at Home." Dr. SAMUEL O. L. POTTER.
9. "Better Instruction in Physiology and Hygiene in Our Public Schools." Dr. S. S. HERRICK.
10. "Purification of Drinking Water, Chemically and Microscopically Considered." Professors A. A. CUNNINGHAM and THOMAS BOWHILL.
11. "California, and Tuberculosis." Dr. D. A. HODGHEAD.
12. "The Ideal City from a Sanitary Standpoint." Dr. W. T. BURRES.
13. "Tuberculosis and its Communicability to Man." Dr. C. B. ORVIS.

### EVENING SESSION.

14. "Notes on the Hygienic Condition of School Buildings, and Practical Hints on the Management of School Children." Dr. WILLIAM A. EDWARDS and Dr. LELAND E. COFER.
15. "The Role of the Veterinarian in Human Prophylactic Medicine." Dr. F. A. NEIF.
16. "Dairy and Milk Inspection." Dr. GEORGE E. CHARLES.
17. "The Prevention of Infectious Diseases of the Eye." Dr. W. F. SOUTHARD.
18. "The Check-Rein; Its Uses and Abuses." Dr. C. L. BARD.
19. "Important Facts and Practical Difficulties Encountered in Enforcing Sanitary Regulations." Dr. GEORGE W. DAVIS.

# CALIFORNIA STATE SANITARY CONVENTION.

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MONDAY, April 15, 1895.

DR. C. A. RUGGLES, President: Ladies and Gentlemen, you will now please come to order. It affords me great pleasure to introduce to you a gentleman whom most of you know personally, and many of you by reputation, and all will be glad to hear the words of welcome from his Honor, the Mayor of San Francisco, Adolph Sutro. I now have the pleasure of introducing him to you.

---

## ADDRESS OF WELCOME.

By MAYOR ADOLPH SUTRO, of San Francisco.

Nothing could give me greater pleasure than to welcome you, the members of the State Sanitary Convention, to your annual meeting in the City of San Francisco. Science has added much to our knowledge of sanitary measures, and, above all things, the microscope has revealed to us a formerly unknown world. When the microscope was first invented, about a century and a half ago, an English writer gave in a few lines the gist of all bacteriological science when he said:

"Fleas have little fleas who always try to bite them,  
And these again have smaller ones, and so *ad infinitum*."

That disease is largely due to microbes has been abundantly proven, and when the cause of disease is once clearly established, the remedy will not be far off.

Since the invention of railroad facilities, cities have grown to extraordinary proportions, and the human family gathers together from all parts of the country. Men and women want to live at the metropolis and take advantage of the superior attractions and facilities for knowledge, amusement, and comfort. Most important, then, does it become to provide for cities sanitary conditions as nearly approaching perfection as it may be possible.

The first question we usually ask in a new place is, "What sort of a climate have you?" We in California can boast of the best, and to a large extent the prevailing winds carry off deleterious influences, and all we have to do is to provide a proper sewer system, of which, unfortunately, the citizens of San Francisco cannot boast. But let us hope that in the near future a proper system is in store for us.

The next question to be asked is, "What sort of drinking water have you?" Of that we cannot boast, either. In the grand mountains of the Sierra Nevada we have a treasure stored up—a priceless treasure of pure, limpid drinking water that is gathered in the high valleys from the

melting snows—a treasure which we carelessly allow to escape down the Sacramento and San Joaquin Rivers into the ocean, while we continue to drink contaminated water filled with bacteria. Is this our boasted intelligence? This city could be supplied with pure water at less cost than we now pay for the impure, and at the same time confer a similar boon on all the coming generation. It is left for you, gentlemen, to express a strong opinion on this subject.

The members of the Board of Health of a large city hold a post of great responsibility. Good sewerage, pure water, pure milk, and pure food come under their care, and for the good health of the citizens they are mainly responsible.

In the multitude of counsel there is wisdom, and I welcome the tendency of the age to hold congresses, where ideas are enlarged, new thoughts developed, and where a fraternity is established amongst men of the same calling.

Again, gentlemen, let me welcome you here in San Francisco.

THE CHAIRMAN: We have listened attentively and with pleasure to the words of welcome that have been uttered by the representative of this great city by the sea, this great metropolis of the Pacific Coast, and I thank you, sir, in the name of the State Board of Health, and of the Third Sanitary Convention here assembled, for those kind words of welcome and the spirit which dictated them. We, as medical men, of course, are engaged in the healing art. Our province is to cure disease, which is a high, holy, and noble calling. But we also, as sanitarians, are engaged in a calling equally as high, equally as holy, equally as noble—that of the prevention of disease. And now, sir, in the name of the gentlemen here assembled, I again thank you for the words of welcome that you have uttered.

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#### ELECTION OF OFFICERS.

THE CHAIRMAN: The next business in order now, gentlemen, will be the election of officers for the ensuing year. The first will be the election of the President. Will you please nominate?

DR. BARD: It gives me great pleasure to place in nomination the name of Dr. C. W. Nutting, of Siskiyou County.

WINSLOW ANDERSON: Mr. President, I desire to second the nomination of my old friend, Dr. Nutting, as a gentleman who has served long and faithfully on the State Board of Health; a gentleman who is most eminently fitted for the position of President of the Sanitary Convention. I second the nomination of Dr. Nutting.

(Nominations closed, and the Secretary was instructed to cast the ballot of the convention in favor of Dr. Nutting.)

THE CHAIRMAN: The next thing in order is the nomination of Vice-President.

DR. J. R. LAINE: I desire to place in nomination a gentleman from the opposite direction. We have now elected for President a gentleman from the northern portion of the State. I want to nominate for Vice-President a gentleman from the southern, or near the southern, portion of the State; a gentleman well known to you all, who thinks it of enough

importance to come here and contribute annually. The gentleman I wish to nominate is Dr. C. L. Bard, of Ventura.

(Nominations closed, and the Secretary requested to cast the ballot of the convention in favor of Dr. C. L. Bard.)

THE CHAIRMAN: Nominations for Second Vice-President are now in order.

DR. J. H. CAROTHERS: One gentleman has seen fit to say that one of the officers is from the far north and the other is from the sunny south. I wish to place in nomination a gentleman from the central portion of the State. I therefore nominate Dr. J. C. McLean, of Alameda.

(Nominations closed, and the Secretary was instructed to cast the ballot of the convention in favor of Dr. J. C. McLean.)

(Dr. Winslow Anderson was placed in nomination for Secretary, and unanimously elected.)

(The retiring President, Dr. C. A. Ruggles, read the following address:)

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#### ADDRESS OF DR. C. A. RUGGLES, RETIRING PRESIDENT.

*Ladies and Gentlemen of the Sanitary Convention:* It has become an established custom for the retiring President to address the convention upon his leaving the chair. In accordance with that custom I wish to call your attention to a few remarks of a retrospective nature: In the name of the State Board of Health I wish to congratulate you upon the almost complete exemption of our State from the invasion of any infectious and contagious disease during the year past. Much cause for anxiety has pervaded the minds of our sanitary brethren in the East on account of the prevalence of smallpox. But with the exception of a few cases in Modoc County, which were easily controlled and speedily stamped out by the local health authorities, we have been fortunately exempt.

La grippe has been quite prevalent and very fatal among elderly persons during the past year.

At the time when we were preparing for an expected invasion of Asiatic cholera the State Board of Health advised all local boards to cause much diligence to be exercised in having their several respective localities made clean. Fortunately we were spared from such a call from so unwelcome a visitor. But all sanitary reports to the State Board showed a very positive and well-marked decrease in the number and the mortality of diphtheria cases, encouraging us to continue in advising as perfect a system of cleanliness as is possible. In this connection, while I have no desire or intention to speak as to the curative properties of any remedy, I am constrained to remark that the literature of the day justifies the statement that in diphtheritic anti-toxine we have a prophylactic agent that is well worthy your serious consideration.

I am glad to notice a very great advancement in public sentiment as to sanitation. The people are beginning to inquire as to the *prevention* of disease, as well as to its *cure*. Much interest is being manifested in the subject of sewerage. Cities and large towns are studying the best methods of protecting their water supply from the percolation of pathogenic germs, and are fast arriving at the conclusion that altogether too intimate relations are existing between the well and the cesspool

and the privy vault, and from us they should receive all possible encouragement to continue in their good work. The efforts of sanitarians in general, and our local health officers in particular, have been happily rewarded in their endeavors to instruct the public mind, producing a more perfect understanding as to the communicability of disease and the necessity of certain preventive and restrictive measures, causing a pleasant and graceful submission to quarantine, isolation, and other sanitary methods, readily acceding to temporary personal inconvenience for the good of the public. At the commencement of my remarks I stated that I should confine myself to thoughts entirely of a retrospective nature, but I trust I may be excused for my deviation from what *had been* to what *ought to be*, done.

The great importance of the subject will justify my action. I allude to the milk question, one of such moment as to demand our most serious attention. Sanitary statistics show us that 60 per cent of hand-fed babies in our cities and large towns perish before they are five years old. That the mortality from nutritional diseases, directly or indirectly, during the first year comprises nearly 90 per cent of the whole. My firm impression and belief is that this premature, and in many instances unjustifiable, weaning of babies, is too fashionable and cannot be too harshly condemned, as it exposes the little innocents to all the dangers of contaminated milk, or to many of the not less dangerous artificial foods. There is no doubt that the logical sequence to be deduced from these premises is that a very large part of the mortality in cities and large towns is traceable to cow's milk as a cause. The number of diseases known to be transmissible by milk have multiplied with our increasing knowledge of pathology. The formerly much used terms, intestinal catarrh, summer complaint, cholera infantum, marasmus, teething diarrhœa, and a host of other vague designations may now be spoken of as acute or sub-acute milk infection, referring by these terms to the effects of the numerous poisonous products of the bacteria found in milk. Taking into serious consideration the great importance of the question, the State Board of Health, as an advisory body, has concluded to recommend to all local health boards to procure the formation of city or town ordinances which will cause all cows producing milk sold in said cities and towns to be inspected as to their health and to their proper sanitary surroundings, an order of things now in use in Alameda.

Scarlet fever, which in former years has been so great a terror both on account of its fatality and its sequelæ, has been unusually light, and our local health officers are entitled to much credit for their thorough manner of isolation and restriction, rightly believing that though it was light and scarcely worthy of so much notice, they were obliged to adopt the same quarantine regulations, as a mild case was accompanied by the capability of producing a very severe one. At the Sanitary Convention at San José last year the subject tuberculosis monopolized most of the time. Much was said, and was well said, as is evidenced by the fact that the printed proceedings of that meeting have been in great demand by our Eastern co-laborers. While there was some difference of opinion as to some of the restrictive measures advocated, there was great unanimity as to the necessity of the public being better instructed as to the communicability of the disease and its prevention. But with all that has been said, and the awful object-lesson daily presented, it is something past understanding why the state of general apathy and

apparent indifference that seems to pervade the minds of those who should strive to instruct the people in those important matters; with all the facts staring us in the face; the full knowledge that one in every six or seven of all deaths is from this disease; the bacteriological certainty of its communicability—all these facts are naught in staying the progress of this great white plague; “this pestilence that walketh in darkness and the destruction that wasteth at noonday.” On it marches unobstructed and unimpeded, taking the fairest and best of the land as its victims, and we the custodians of the public health are doing so little. During the last year our worthy Secretary informs us that there were two hundred fewer deaths from this disease than during the previous year, but we as health officers cannot take any credit for that decrease in mortality, but rather ascribe it to the stringency in the money market, which compelled our Eastern friends to deny their sick the privilege of dying in California, the too much boasted and too highly lauded sanitarium for all tubercular patients. I do not wish to be considered a scold or a fault-finder, but if the public are not instructed in these matters by those who well know about it, whose fault is it? who are to be blamed?

With all due respect to my professional brethren, I say it reluctantly, that the fault lies with us. Much good has been accomplished by the efforts of sanitarians in bringing up the public mind to the point of demanding pure water by a better system of sewerage, of lessened mortality from diphtheria by establishing a more thorough plan of cleanliness, much diminished fatality in scarlet fever by rigidly quarantining even very slight cases. If these things can be and are done, why is it that in the very localities where all these flattering results have been accomplished tuberculosis has not only not decreased, but has actually increased in percentage of mortality? Who is responsible? My earnest desire is that this convention will express itself in no uncertain manner as to the duty of sanitarians in this matter.

Thanking you for your kind attention, I now, with much pleasure, will introduce to you your newly elected President, Dr. C. W. Nutting.

---

(Dr. Ruggles then introduced the newly elected President, C. W. Nutting, who spoke as follows:)

#### ADDRESS OF DR. C. W. NUTTING, PRESIDENT-ELECT.

*Ladies and Gentlemen of the Third Sanitary Convention:* The first thing that I desire to do is to thank you for the honor you have conferred upon me in selecting me to preside over this, the Third Sanitary Convention. We who are medical men and women know that it is not customary for the President of a Medical Association, or for the man who presides over medical deliberations, to make much of a speech on his installation into office. My friend, Dr. Ruggles, has just shown you that the time at which the President of a Sanitary Convention or the President of a Medical Convention is expected to address the body over which he presides, is at the end of his term of office. You will therefore excuse me to-day, and when my term of office has expired I will follow the precedent so ably set by my friend Dr. Ruggles.

I again thank you for the honor, and we will proceed with the business of the convention.

(It was moved and seconded that a Committee of three on Publication be appointed. On motion of Dr. J. R. Laine, the appointment of the Committee on Publication was deferred until the evening session.)

### A PLEA FOR THE HOSPITAL AT HOME.

By SAMUEL O. L. POTTER, M.D., M.R.C.P.L., of San Francisco, Cal.

Nowadays we see many princely homes, in process of construction or already built, in which the designers have remembered every one who may cross the threshold in every and any capacity. The visitor finds therein his "guest-room," the caller her drawing-room and retiring-room; there are rooms set apart for smoking, billiards, cards, and music. The studiously-inclined finds a library for his use, however few may be the books therein. The lady of the house has her boudoir; the master, his "den"; the children, their nursery and play-room. The butler has his wine-room; the cook, her kitchen and pantry; the maid, her scullery; and the wash-lady, her laundry. The horse has his stable; the dog, his kennel; and the cat, her cushion. But if we ask for the sick-room—the place provided for members of the family stricken with severe or contagious, perhaps fatal, disease—we will find that no architect has yet thought of designing in the palatial home a place for the illness which comes to almost every one at some time during existence, or for the final scene so certain to be the end of life for all.

While ordinary, middle-class folk are content, even glad, to go into one of our fine, modern hospitals, when ill, the very wealthy find that, with all their luxurious surroundings, they cannot in illness secure isolation at home from the disturbances of the family life, or from the racking noise of the city in which they dwell. It is obvious that, however perfect a house may be in other respects, it cannot be considered a complete home so long as it contains no special provision for the sickness which may come at any moment to even the healthiest of its inmates. Too often the so-called "spare-room," or "guest-chamber," is the only apartment available for use in sickness, which is neither hospitable to one's visitors, nor kind to our sick.

Every family physician, and householder of experience, knows well the discomfort of the ordinary family routine when disease enters the family circle. The bells are muffled, and the servants scolded for every slamming of a door; the older children wander around the house speaking with bated breath, in the all but vain effort to suppress the exuberant animal spirits of the younger ones. Playmates are forbidden the premises; guests take their departure; a trained nurse comes upon the scene to dominate the household and drive the servants to the verge of rebellion. The home, in fact, becomes the most uncomfortable place to all its healthy inmates, as a consequence of the sickness of some one therein. And then, if a contagious disease be prevalent, and suspected to have come into the family, how great the anxiety upon all, the depression on some, the terror on others—physical and mental conditions sufficient in themselves to so lower the vital resistance as to

invite disease on all who form that household. But if the disease prove to be the dreaded smallpox, how the hearts of the family are wrung at the thought of the inevitable removal of their dear one to the care of a public pesthouse!

So, also, when a member of the family is afflicted with that undoubtedly contagious disease, consumption, how necessary for the safety of others that the patient should live in partial isolation, and should sleep where no upholstery, or hangings, or papered walls, or carpets can retain the expired or expectorated germ of the disease, to dry and be inhaled as dust by healthy persons!

In our numerous hotels and boarding-houses, where nearly one half of our modern population dwells, the effect of sickness, especially if contagious, is a serious one to all concerned. The patient cannot obtain the necessary quiet, or the requisite articles of food; the other inmates feel themselves endangered by the proximity of disease, and begin to move away, while the proprietor is worried to death between the fear of disobliging a profitable patron and the desire of retaining his numerous guests. In the smaller cities and at the summer resorts there are no hospitals to which the sick one can be removed; and sickness in a hotel becomes a proverbial discomfort to the entire establishment.

Still greater is the difficulty when insanity, in acute or chronic type, makes its dreadful presence known in the home of a family, or in a hotel or boarding-house. The maniac's yells are heard by the neighbors, and give rise to all sorts of rumors. There is no sleep for that household while the shrieks of one of its members can penetrate the stillness of the night. There are no means of securing the safety and isolation of the stricken one. The dreadful alternative, removal to an insane asylum, becomes necessary for the sake of all, even in cases of acute and curable mental derangement, with the consequent blight upon the future life of the one who has ever been incarcerated in a mad-house.

Every home of any pretensions should contain a suite of rooms, especially designed and arranged, and kept ready for the use of the sick members of the family and their attendants. Such a suite should be located, in a medium-sized house, on the warm upper floor, and in the southeast corner thereof, so as to obtain the best sunny exposure. It should be separated from other rooms on the same floor by halls with windows at their ends for free ventilation, and floors covered with a strip of heavy cocoa matting to deaden sound. It should be provided with a water-closet and a bathtub, emptying, not into the public sewer, but into a special receptacle, capable of being easily emptied and disinfected. In fact, a good earth-closet would be better than a water-closet, and equally efficient. There should be no feather-bed, no fancy cushions or upholstered furniture, no pictures, no wallpaper, no curtains or hangings, or only those of the cheapest kind, to be destroyed after every illness. All the furniture and other belongings should be plain and simple, capable of being easily cleansed and kept as aseptic as that of a hospital. The floor should be bare and painted, the walls and ceiling rough-finished and painted, with perhaps a dado of glazed ornamented tiles. There should be no sink, wash-basin, closet, or other contrivance connecting with the sewers. Opening off the sick-room there should be a sleeping-room for the nurse on duty, and also a small room furnished with a gas or electric stove, and the other requirements of a diet-kitchen. The entrance should be through a vestibule of good



size, so that the door of the sick-room would not open directly into the hall. In this vestibule should hang a large rubber coat to cover the clothing of the attending physician, and it should contain several pairs of felt slippers; large enough to go on over the boots of any one who may come in. There should also be a washstand in the vestibule, with toilet necessities and disinfecting solutions, for the use of the physician before taking his departure. By such precautions the danger of his carrying infection to others would be minimized. The rooms should be provided with a well-lighted closet, containing everything requisite for nursing a case of typhoid fever, scarlet fever, variola, diphtheria, or other contagious disease, all arranged in order on shelves, and properly labeled. The necessary appliances for a surgical operation or a case of labor could be readily added when actually needed. The entire arrangement of this *Home Hospital* should be placed in the hands of the family physician, who will know exactly how to fit it up. When completely furnished it should be scrupulously respected, and never used for storing away empty trunks or broken furniture, but always kept clean and in order, ready for a patient at any moment.

The architectural arrangements should include provision for constant ventilation, independent of the windows, in case these should have to be kept closed. The latter should be guarded by heavy interior shutters, capable of being locked if necessary, so that a delirious or insane patient could not get access to the glass. Or, the sick-room need have no windows at all, light being admitted by an inaccessible skylight, properly shaded by horizontal blinds.

In the more pretentious houses and the palaces of our millionaires, where ground space and expense are practically unlimited, the home hospital might be in a separate structure, detached from the main building, but connected therewith on each floor by a light, lattice-inclosed, and covered bridge. The ground floor of this building would contain the necessary heating and laundry apparatus; the second floor would have on it the sick room, nurse's room, bath, closet, and diet-kitchen; while the upper floor would be arranged in two or three sleeping-rooms for the physician on duty, an extra nurse, and any member of the family who, in a case of contagious disease, might prefer isolation with the sick one to enforced absence.

So equipped, as I have tried to indicate by these suggestions, the members of a wealthy family would enjoy in sickness all the comfort and security now only attainable in the most modern hospitals, the public would secure increased protection from the spread of contagious disease, and the owner might safely defy the power of the health officer to remove the patient to a pesthouse. The latter may safely be assumed, for it could be shown to the satisfaction of any reasonable court that the interests of both the public and the patient are better guarded in this home hospital than they could possibly be in any public pesthouse ever yet erected and maintained by the servants of the body politic or the appointees of a political machine.

In a large hotel or boarding-house, such a hospital suite would be of incalculable benefit to every inmate, as well as to the sick. Instead of the usual panic, the routine of the establishment would go on undisturbed, even in presence of contagious disease; and the proprietor would feel as much pleasure in advertising and showing his home hospital as he does every other feature of the well-appointed hostelry.

While these suggestions are chiefly applicable to the homes of the rich, they may be modified with almost equal benefit for the dwellings of our great middle-class householders. Almost any owner of a home could set apart a quiet, sunny upper room or two, plainly and cleanly furnished, for the use of the sick. With an annual coat of paint, and a few simple articles such as any physician could suggest, the family sick-room would always be ready for illness of even a serious character. The danger lies in the temptation to use such a room for storage, or for the temporary accommodation of a visitor or a servant; which, if yielded to, would defeat the object aimed at.

As to my own share in the conception and promulgation of this idea, I may say that these suggestions were advanced by me several years ago in a faculty meeting at Cooper Medical College, as the subject of a popular lecture which I was asked to deliver. Another member of the faculty, however, having announced his intention of lecturing on hospitals during that season, I abandoned my intention and gave way to him. I published a brief synopsis of the matter in the last edition of my *Handbook of Materia Medica, Pharmacy, and Therapeutics*, under the title of "Sick Room," and also in the *Pacific Medical Journal* for September, 1894. The idea was original so far as I was concerned, and I had never previously seen anything on the subject in either medical or architectural literature; but I am aware that it has been partially carried out in some large boarding-schools for many years past.

#### Discussion of Paper Read by Dr. S. O. L. Potter.

DR. C. A. RUGGLES: I am very much pleased with the idea that after a paper has been read it is to be discussed, because much is to be gained by discussion, and I hope all papers will be thoroughly discussed. I have taken a great deal of interest and paid a great deal of attention to the reading of the paper, and particularly to that part which relates to missionaries, but that is outside of my range; however, the particular point is that the physician should protect himself from communicating disease to somebody else. It has been my privilege to be connected with health departments the most of my life. I state it here as a positive fact, in my mind at least, that disease has been carried by physicians from patients to healthy people, on account of the lack of the care that Dr. Potter suggests. Diseases like diphtheria, scarlatina, and smallpox are communicable. It seems to me as though the physician who is careless in visiting patients who have such diseases, and who neglects taking the proper care to prevent communication, should be indicted by the first grand jury that sits; that is my opinion about it. I know that diseases such as smallpox and diphtheria have been carried about by careless doctors. You take a case, as they used to take diphtheria. I don't know how they do it with anti-toxine, but the way they used to do, was to swab out the child's throat, and the doctor got it on his coat and whiskers, and he went, perhaps, without having washed his hands, or without combing his whiskers, fifteen miles away probably, and communicated it to another child, and the wonder was how it came there. Some said that it was a visitation of Providence, but I say it was the carelessness of the doctor. I am glad to see that Dr. Potter has brought the subject up so positively in regard to the necessity of physicians not being the media of communication.

DR. WINSLOW ANDERSON: This subject is of paramount importance, it seems to me, not only from the point that has been raised, namely, contagion, but also from another, and, perhaps, an equally important one, namely, the comfort, the health, nay, the life of the patient. It was my misfortune two years ago to be very ill in bed for eight weeks. I then recognized, as I do now, that had I had a hospital at home, or a room particularly adapted to sickness, I certainly should have been much better off. Nothing can be more important than to have a sunny room, properly constructed and properly ventilated, where a member of a family may be taken care of as thoroughly as in any hospital. It prevents the great danger attendant upon the removal of the patient. It gives one at home all the necessaries of the sick-room. And the importance of this original suggestion, which I had never seen before Dr. Potter called my attention to it last year, I believe is of more value than we, at first thought, would give it. In nearly every household, at one time or another, there is an *acouchement*, and all of us know how sadly deficient the lying-in chamber is from a sanitary standpoint. The carpets on the floor may be dirty; have been there perhaps for years. Sepsis, puerperal fever, and the death of the patient may follow from the unsanitary surroundings of the room, because it is well recognized that carpets, hangings, cushions, etc., cannot be aseptic. For this reason, alone, I would strongly urge the fact upon the members of the Sanitary Convention, that a hospital at home is an essential. Few households have escaped without some contagious disease—diphtheria, scarlet fever, measles, whooping-cough, etc. How much better all these could be treated in a hospital at home. I think the suggestions of Dr. Potter are of great value.

DR. POTTER: Mr. President, if there are no further remarks, in closing the matter I would like to make another suggestion, and that is that we have in this country a great many boarding-houses, rooming-houses, hotels—in fact, one might say the majority of the population live in such. Now, when sickness comes on in one of these places the effort on the part of the proprietor is to get that case out of the house just as quickly as he can. You all know how it is. He consults the doctor, and tries to get the patient out as quickly as he can, so that he can again rent the place. Suppose the law should compel that boarding-house keeper to provide such a suite of rooms as I suggest, arranged for that purpose, and made it an obligation on the part of the proprietor of the establishment to keep it in order, as it would be to keep his fire apparatus or his plumbing in order. The terror of the sickness would be banished. The sick ones could be kept in the hospital of the boarding-house or hotel, and that would be all in regard to it. I maintain that the public has an interest in this subject. The sanitarians are interested in this thing, and if it has never before been advanced by any one, it is time, I think, that the profession in these Western States took hold and advocated it. Where so many new establishments are going up it would be so easy to get it commenced, and once you have begun a thing like this it goes nowadays all over the world.

DR. J. R. LAINE: I believe there is a good deal in the idea of having hospitals at home, but it must be seen that in the houses of the rich it will be considered in the light of a luxury. It is not among the rich that we as sanitarians have to deal with disease. I believe that if the idea of a hospital-room is to become established it will have more to do

with the boarding-house and with the hotel than it will have with the private home, unless it be as a luxury. It is out of the question to make a hospital-room in a house of from seven to eight or ten rooms, with an average family of perhaps four to seven persons. Very few will perhaps do so, but nevertheless the conception of the idea is valuable.

Now, I have very little respect for the adult man of ordinary intelligence who will permit himself to get varioloid or smallpox. It should be considered a shameful thing for a man to do; as much so as to get an obscene disease under the lights of present knowledge. It is such a simple matter for an individual to become protected from smallpox, and yet it is suggested that we should urge the rich man, under this plea, to build a hospital-room so that in case he or his family should get smallpox, they would not be dragged out to the pesthouse. It is indecent for him to let himself get into a condition that would compel people to drag him to the pesthouse. But it is not so with diphtheria; it is not so with scarlatina, and it is not so with tuberculosis. These may overtake the children, or may overtake the adult residents of the house, and it is proper that they should have, if they can afford it, a place to care for the sick; but I must emphasize what Dr. Potter has said with reference to the necessity of such a room or rooms in large boarding-houses and in hotels. I have seen frequent instances where it has appeared to me to be a positive injury to patients to take them out of their hotels to hospitals outside. Even in an ordinary case of pneumonia, it is regarded by the hotel-keeper as something that he desires to get rid of as expeditiously as possible. The patient should be taken care of in the house where he lives, but we all know that the chambers in our private residences are quite good enough for the ordinary disease. They should not be used by people who have tuberculosis, or who suffer from consumption. They should not be used for the treatment of scarlatina, and yet we all know that we have frequently to temporize with patients, for delicate persons are often frightened very badly, and made much worse if moved from the place where they are accustomed to sleep. So it must be considered in the light of a necessity with reference to hotels and boarding-houses; in the light of a luxury with reference to the residences of the rich, and an expedient, if possible, in the houses of the poor.

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## NOTES ON THE HYGIENIC CONSTRUCTION OF SCHOOLS.

### With Some Practical Hints on the Management of School Children.

By WILLIAM A. EDWARDS, M.D., of San Diego, California, Fellow of College of Physicians of Philadelphia; and LELAND E. COFER, M.D., United States Marine Hospital Service, San Diego, California.

School hygiene, besides being a study of preventive medicine, is, or rather should be, a study of common sense. Unfortunately medical men are very seldom consulted as to the proper arrangement of school-rooms, and still less so as to the care of the school children while they are indoors; therefore, if we can approach the lay authorities, who generally have charge of the construction and management of schools, through a general paper, and that relieved of seeming monotony by

the absence of statistics and technicalities, we may perhaps demonstrate the necessity of medical surveillance both in the construction and management of schools, and thereby raise the health standard above what it is at present.

#### CONSTRUCTION OF SCHOOL-HOUSES.

In the construction of school-houses, the same hygienic principles are applicable as in other houses, only they should be doubled, if such a thing is possible. The site for a school building should be selected with as much, or even more, care than that of a dwelling. Proximity to marshes, ponds, and high buildings should be avoided, and if there be only one hill in the town where a school-house is to be built, that hill, or a portion of it, should be secured, if possible, for the site. It is not necessary to call attention to the advantages in the way of fresh air and drainage which either the summit or the slope of the hill affords.

School-houses, like hospitals, should be built on the pavilion plan, and the ground covered with asphalt before the buildings are put up. If the buildings are constructed of wood, as they should be, the greater extent of surface required, and the consequent increase of the cost of the land, would be obviated by the saving on strong stairways, and second and third-story floors, and heating and ventilating flues, all of which have to be constructed, in the average three-story school-house, with the best of material, and in the most perfect manner, and with expense in keeping with the work. The floor of the building, which should be at least ten feet above the already drained and asphalted ground, should be made double, with paraffine-coated paper intervening, and all joints accurately joined. It will be readily seen that the building would be entirely free from permeation by ground air, both on account of the asphalt court and the air-tight floors. The walls should be tinted light green and the ceilings white; and to insure a free transpiration of air, paint should not be used, but some preparation of lime. To prevent as much as possible the accumulation of dust and other impurities, and to facilitate the cleaning process, the junction of wall and ceiling and wall and floor should be rounded. In other words, there should be no corners in the building. This is really less expensive than the old-fashioned square corners and fancy borders.

Well-lighted and well-ventilated side rooms should be provided for the reception of outside clothing, umbrellas, overshoes, and particularly for the lunches, which are frequently overlarge; for the stale odor of decayed animal matter, which we all remember when we look back on our school days, has more than once, I will warrant, formed a culture medium for the propagation of various germs that in their dissemination have contributed to the ill health of school children. Therefore, under no consideration, should children be allowed to carry their lunches into the class-rooms.

The halls should be very wide, both to insure free ventilation and to furnish a play or calisthenic room for the children, who, at regular intervals, should be required to leave the class-rooms for a period sufficient to insure a change of air. They are then returned to their respective class-rooms, and the halls flushed with fresh air. This work should be systematically performed by the janitor, under the personal supervision of the teachers. It is reasonably certain that this system

of ventilation, regular exercise, and change of position is not only an excellent aid to the more elaborate artificial systems of ventilation, but is in some cases as efficient, if not more so, than any other method.

Now, as to the size of the school-room. It is very desirable, if not necessary, that a child of an average age of fifteen years should have about  $66\frac{2}{3}$  cubic meters of fresh air per hour. Now, there are several ways of providing this, and it is an important point, as it involves a question of expense in any case. The least expensive and most certain way to insure each pupil  $66\frac{2}{3}$  cubic meters of fresh air every hour would be to actually allow that much for each desk in the class-room, and by flushing the room every hour, by raising the wall and ceiling windows, to ventilate the room without a special ventilating apparatus. Thirty-three and one third cubic meters to each pupil would require flushing every half hour, and so on, in this ratio, could the air space be decreased, and consequently the inconvenience of flushing the room at short intervals be increased. A model class-room following the above scale should be about 10 meters long, about 7 meters wide, and  $4\frac{1}{2}$  meters high, to contain forty persons, including the teacher, and each person having about 7 cubic meters of initial air space. Now, by the flushing process, the air would have to be completely changed ten times or thereabouts every hour; therefore, it will be readily seen that other methods of ventilation must be resorted to so as to keep the fresh air ratio at the same standard and at the same time not disorganize the class every six minutes. Now, by having the rooms emptied every half hour and the windows raised, we will obtain 14 cubic meters of fresh air per pupil; that will leave  $52\frac{2}{3}$  cubic meters per pupil to be acquired by other means during the hour. This can be done, and a great deal to spare, by having in the center of each class-room a quadrilateral brick fireplace, with four grates, each about one cubic foot in size, and with iron fire-backs, which shall form a chamber in the center not less than 4 cubic feet in size. This should be connected to four sheet or galvanized iron cylinders, with their outlets under the rooms. After the air is heated in the chamber it will rise and pour out into the room about 3 feet above the floor, through small square holes, whose aggregate dimensions shall be 4 cubic feet. In Sajous, 1892 (I forget the reference), it has been suggested to plug each hole with cotton gauze saturated with lime water, which in uniting with the  $\text{CO}_2$  and  $\text{SO}_2$  will form the carbonates and sulphates of calcium, and thus prevent the entrance into the room of the noxious gases in the hot-air chamber. The grate just described, when built in a wooden pavilion school-house, is attended with comparatively little expense, whereas in the old three- or four-story buildings it is necessary to have steam fans and other expensive heating and ventilating apparatus. A Bury window ventilator should be inserted in the top of each window, which latter, by the way, should extend nearly up to the ceiling.

#### LIGHT IN SCHOOL-ROOMS.

Next to ventilation, light is the most important subject. We will not dwell here on the statistics of diseases of the eye in school children, but it would perhaps be worth while to suggest a plan for the bettering of those same statistics. In the first place, the old idea that study-rooms should face toward the north is as absurd as it is in some case impracticable. In the day time light may be always obtained by ceil-

ing windows, and irregularities in the intensity of the light may be readily corrected by sliding curtains. Green sliding curtains should be provided at all of the windows, and the teacher should see that curtain windows, which, by their position might transmit too much light or light in the wrong direction, are closed.

The relation of good light to the position of the pupils should be noted at different times of the day, and advantage taken of this by causing every pupil, at a given signal, to turn his desk and chair, both of which can be mounted on casters, in the direction indicated. Every child should be required to wear a large eye shade while in the classroom, and it would be interesting to note the changes in the eye statistics after four years of observation in the average city grammar school.

The curtains of the windows should be so arranged that the light can only enter from the left side of the pupil. When admitted from the right side, the shadow cast by the pen in writing interferes with good vision; if admitted directly in front of the pupil, the glare will injuriously affect the eyes; while if it enters from behind, the book or paper of the pupil will be so much in shadow as to compel him to lean so far to the front in bringing his eyes nearer to book or paper that myopia is very likely to be developed. The teacher should watch each and every pupil, and discourage the practice, so commonly seen in school children, of bending over book or paper. If it is found that there is a reason for this, such as beginning nearsightedness, the parents of the child in question should be advised to consult a physician. Where it is done through carelessness, it should be prohibited, and the offender marked for a breach of deportment. We all know the relation which bending over books bears to myopia, and we also know that nine out of every ten school children have the habit referred to, and we have only to take the trouble to look up the statistics to be assured as to the result. In examinations of over 30,000 pupils of grammar and high schools in Germany, Austria, Russia, and Switzerland, it has been found that the average proportion of myopia is a fraction over 40 per cent, varying, in the different classes, from 22 per cent in the lowest to 58 per cent for the highest classes.

In some particular schools, for example in the high school of Erlangen, the percentage in the higher classes was 88 per cent, in the gymnasium of Coburg 86 per cent, and in the gymnasium of Heidelberg the proportion of myopic students in the highest class was 100 per cent in 1887.

These interesting statistics were prepared by Dr. Rohé, and they show very plainly that myopia increases progressively from the lowest to the highest class.

#### ARTIFICIAL LIGHT.

There should be no artificial light in a school building, as with a good location, and well-arranged windows, there should be plenty of light during school hours. This will not only spare the children's eyes, but it will save pollution of the air, and also a considerable bill each month, which fact I mention in favor of pavilion schools as money-savers.

## WATER-CLOSETS AND PRIVIES.

These necessary resorts should receive particular attention, not only as to their construction, but as to their condition from day to day. They should be regularly inspected every day, and any defect remedied. Thanks to the pavilion school-house, these places of retirement cannot be placed either in the cellar or basement, which latter unfavorable location is so frequently selected in our school-houses. A well-aired, large room, heated and lighted like one of the class-rooms, should be provided, with a half partition dividing the male from the female quarter. Both of these divisions should open into the large calisthenic hall, as in this situation they can be visited by the pupils without attracting attention, the dread of which causes the pupils, especially the girls, to neglect obeying the calls of nature, from which neglect many disorders arise.

## SCHOOL FURNITURE.

The desks, which should be made of hard polished wood, should be adjustable to children of different sizes. The seat, which should be attached to the desk, should be made independently adjustable, and the whole mounted on casters. Seats and desks should be graded according to the sizes of the pupils, not their ages or class standing. The desks should be slightly sloping, the edge nearest the pupil being about the level of the elbows. The front edge of the seat should project a little beyond the near edge of the desk, so that a plumb-line dropped from the latter should strike the seat near its front edge. If the seat is not thus brought slightly under the desk, the pupil is compelled to lean forward in writing, which position prevents proper expansion of the chest, and increases the blood-pressure in the eyes, a condition promotive of myopia. Seats should be only high enough so that the feet may rest flat upon the floor.

Unfortunately, statistics are not very full upon the relation of improperly constructed school desks and seats to spinal curvature in school children, but that is no reason why we should not give the matter some attention and if possible prepare statistics which shall show that spinal curvature is a rare trouble among our school children. Guillaume found lateral curvature in 218 out of 731 school children, a proportion of 29.5 per cent. Among 30,000 Danish school children, 13 per cent had spinal deformity. Eulenberg found that among 1,000 persons with lateral curvature of the spine, the disease began in 887 between the ages of 6 and 14; that is to say, during the years of school life. I would like to know what percentage of girls have spinal deformity; I can find, in the short space of time at my disposal at the present, only a general estimate, that given by Rohé, of 93 per cent.

One's attention may be called, in connection with this startling percentage, to the habit so commonly seen in school girls, of sweeping their skirts to the left or right, while in the act of sitting down. The clothing forms a pad, upon which she sits with one buttock, and the greater elevation of the latter on that side throws the spinal column out of the vertical line, which is compensated by a partial twisting of the spinal column. The attention of the teacher should be called to this pernicious



cious habit, which can be easily corrected, and its consequences averted, by timely interference.

#### BLACKBOARDS.

Blackboards should not be placed at a greater distance than 9 meters from the farthest pupil, and they should be movable, and mounted on casters. The ground of the board should be dead black, entirely without luster. A very good plan has been adopted by some European schools of having a white board and black crayon. This can be seen at a greater distance, and is unquestionably more advantageous to the eyesight of the school children.

"A little less brain: a little more health," is a legitimate demand that we may make of legislators and school boards. That every school board should have among its members one or more medical men, is a fact which I think is perfectly plain to any one who will give the matter even passing attention. The diseases of children, such as derangements of the digestive organs from improper food, nervous disorders from imperfect ventilation and excessive mental strain, and the ocular and spinal troubles, all have a cause, and a cause which if removed will surely raise the health standard. This can only be handled by proper legislation in the direction of providing a medical school board in every town, and giving this board the power to regulate school hygiene and to give the public the benefit of their experience, not to mention the benefit the school children may derive from this plan.

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### PHYSIOLOGY AND HYGIENE VS. ATHLETICS IN PUBLIC EDUCATION.

By S. S. HERRICK, M.D., of San Francisco, Cal.

#### I. PHYSIOLOGY AND HYGIENE.

Some years ago Herbert Spencer, in his essay on Education, declared that knowledge to be of most worth which conduces directly to self-preservation. It was not a new truth, but had been so generally disregarded that, to most persons, it was a discovery; and his reasoning is so convincing that the conclusions are generally accepted without reserve.

Hygiene, in its concern for self-preservation, takes cognizance of the following interests of material life: The nature, quantity, and preparation of our daily food (including beverages), also how and when to be taken; the proper amount and quality of clothing, and its fashion adapted to freedom of movement with adequate protection, according to vicissitudes of temperature, winds, humidity, etc.; our habitations, with due regard to heating, lighting, ventilation, water supply, and wholesome environment; our occupations, with all practicable avoidance of excessive exertion and needless exposure to vitiated air and inclemencies of weather; our recreations and amusements, in due moderation and under suitable conditions; rest and sleep, that they be adequate to our varying wants. Briefly stated, these are subjects of vital importance to every individual, and might, as they deserve, form a prominent part of school instruction.

Some knowledge of anatomy and physiology is the proper foundation of the lessons which qualify one to shun the dangers to life and health in his surroundings. If the study of physical and political geography be thought profitable to the young, though it concern mostly regions distant from home and never to be visited, how much more interesting and practical is the study of the human body, its parts and their functions, for it is our life-long habitation, and one should feel ashamed to be a stranger in his own house. If an acquaintance with history, particularly of one's country, be thought suitable to both young and old, can our instructors be held excusable for leaving us in ignorance of the dangers which threaten life and health, and of the practicable means for averting them?

It is true that some consideration was given to this subject even before the date of Herbert Spencer's essay; but in amount and quality the instruction now offered to pupils in California is hardly superior to what the present writer enjoyed in 1847 as a school-boy. The time devoted to learning self-preservation is limited to a short period in the grammar school course; the great majority of public school pupils never reach this grade; and the teachers do not receive additional instruction sufficient to qualify them for thorough understanding of the subject, inasmuch as it has heretofore been given by those without a medical education. In my judgment, all who receive their education in our public schools are entitled to a share of this knowledge, according to their capacity, and, like mathematics and language, it should be enlarged in the grammar school and high school grades, and afterward in the university.

It is now two years since a movement was made in the State Medical Society, and a special committee was appointed for the purpose of bringing about a more thorough method, beginning with the teachers themselves. This committee labored, to some extent, with the State Superintendent of Public Instruction, with the Principals of the State Normal Schools, and with the Board of Education of San Francisco. It will be remembered that the Sanitary Convention, at its San José meeting, one year ago, adopted resolutions having the same object. Moreover, the San Francisco Board of Education has been importuned by one of its members, himself a practicing physician, for more than two years to appoint a competent instructor for the City Normal School, to the end that the teachers in the future might be better qualified. This Normal School has recently been reorganized, and now for the first time physiology is reviewed, along with other grammar school studies. The Principal gives some additional instruction, and this is supplemented by a few lectures given by a medical graduate.

In order to learn what is done at the State Normal Schools, the following list of questions had been sent to the Principals: (1) Is any instruction in physiology and hygiene given? (2) If so, is it a review of studies gone over in the grammar school, or additional instruction? (3) Are there any lectures, illustrated by charts, etc.? (4) Is the instruction given by a medical graduate, or by one of the ordinary teachers? (5) Is any attention paid to hygiene further than the effects of alcoholic and narcotic agents? (6) Has this branch of instruction been extended within the last two years?

To the above the following reply comes from Chico: "The instruction given in this school extends over a term of twenty weeks of daily reci-

tations, and presupposes a thorough knowledge of the subject as taught in the grammar schools. Microscopic work is done and slides are prepared. The instructor is not a physician. I send you a catalogue."

The catalogue, among other topics connected with this branch, indicates "much experimental work; comparative dissections; study of ventilation." No topic belonging strictly to hygiene is mentioned, except this last.

The reply from Los Angeles states that the instruction is more than a review of the work done in the grammar schools. There are no formal lectures, but the recitations are illustrated as much as possible by charts and casts and by the dissection of natural objects. Heretofore the instruction has not been given by medical graduates, but they contemplate more technical and scientific work, and have made a beginning by a series of lectures on hygiene by a lady physician to the young ladies of the school.

No reply has come from the Normal School at San José.

It is apparent that there is a slowly increasing interest felt in California regarding physiology and hygiene, and there is a hopeful prospect that this branch may become more prominent in education than it has been heretofore. Probably a movement in its favor, started by some members of the medical profession about two years ago, has had some effect, and there is encouragement to the hope that, in time, preventive medicine may be fairly appreciated by directors of public education and by the more intelligent part of the community.

## II. ATHLETICS.

In the educational institutions of higher grade throughout the country there has latterly been no considerable growth in imparting the knowledge of self-preservation; but in contrast we witness a striking and increasing interest in athletic exercises, generally encouraged and promoted by the governing and teaching bodies. It is presumed that these exercises are conducive to health by development of the muscular and respiratory apparatus and by promoting nutrition. This is true while athletics are duly regulated in degree and duration, but the happy medium seems to be impracticable. It is almost impossible to keep athletics apart from competition for prizes, and this has been the case since the institution of the ancient Hellenic games. There always exists a public demand for athletic spectacles, and students cannot resist the temptation offered by the *éclat* of victory. The name of an ancient Greek has been preserved, who died suddenly of joy for the success of his son in one of the national contests, and here in San Francisco we have witnessed the pride of a whole family in the triumph of one of its members as a pugilist, which might have been fatal to an aged heart structurally defective. Intercollegiate contests in rowing, baseball, and football excite as much public interest as a Sam Jones revival, a lynching affair, or a scandalous divorce case, and young men find more satisfaction over victory in athletic contests than in scholastic acquirements, because the rewards are immediate and conspicuous.

We might be indifferent to the vulgarity of such spectacles were they not inseparable from certain features now to be noted. The betting, juggling of matches, and drunkenness often found are not our concern as sanitarians; but there are dangers which threaten the health and lives of contestants. Pugilists are notoriously short lived, and crippled

hearts among amateur athletes are too common. Many others are so moderately affected that they have observed no shortness of breath, and the discovery of valvular lesion and hypertrophy is first made by the medical examiner. Since January 1, 1895, out of the 250 first examinations for life insurance in the industrial branch I have found 12 defective hearts, and in 7 cases there was no history of rheumatism. Of these last, three were amateur athletes, all under 35 years of age. Of the other four, two had been sailors, one a carpenter, and one was a woman 30 years old. The three athletes and the two sailors clearly incurred the defect from overstrain. Not one of this class complained of dyspnoea, or was sensible of any cardiac defect, and they may, under favorable circumstances, live many years; but, at best, their prospect for longevity is damaged.

The professed object of physical training in education is to furnish needed exercise and to develop the defective muscles of certain individuals. These last are comparatively few, and there is no necessity that all should take gymnastics. Manual training in handicrafts, as practiced in polytechnic schools, furnishes both exercise and skill in the use of tools that is useful to every one. At the same time such discipline is absolutely devoid of the objectionable incidents to athletics just observed. The prevailing fashion is for the latter, on several accounts: (1) They afford opportunity for public display and *éclat*; (2) they gratify the popular desire for betting; (3) they cannot be stigmatized as work. They are, in short, an ornamental branch of education; and, as Herbert Spencer has pointed out, the ornamental has always taken precedence of the useful, from paint on the body of the savage instead of clothing to the education of the most highly civilized, in which practical acquirements are sacrificed to elegant accomplishments.

The above may be illustrated by two recent examples, which stand in contrast. A few years ago the Boston Board of Public Education employed a special teacher in physiology and hygiene, and afterward abolished the position. They have, however, a well-paid professor of physical culture, who is a medical graduate, and it is to be hoped that he governs it within safe bounds. On the other hand, the late Paul Tulane, through whose liberality the university bearing his name at New Orleans owes its high standing, expressly ordained that shops should be provided for the instruction of the students in the useful arts and trades, and that no gymnasium should be attached to the institution. In fact, the former German Turn Halle was purchased and converted into workshops, to carry out his intention.

Large sums of money are expended for physical training in institutions for higher education, but, as a business proposition, the investment is found remunerative. These aids to a liberal education attract students, and what would a college be without them? Consequently we see greater emulation in this particular attraction than in any other academic equipment. If all this expenditure of time and money, all this parade and excitement, were merely an advertising device, it would be no more worthy of our attention as sanitarians than the broadside advertisements of rival sarsaparilla makers; but when the newspapers constantly swell the list of dead and maimed contestants on the field of glory, and unobtrusive testimony is gathered by physicians of hearts organically impaired, I submit the question, whether less of showy athletics and more of plain hygiene in public education might not be advantageous in a utilitarian point of view?

## Discussion of Paper Read by Dr. S. S. Herrick.

DR. THOS. D. WOOD: I was one of the committee appointed at the meeting of the State Medical Society two years ago in San Francisco to take under consideration this matter of the teaching of physiology and hygiene in public schools. Not very much was done, I think, by that committee. It was handicapped by the complexity of affairs and committees and red tape which wall about our system of public education. An appeal was made to the City Board of Education in San Francisco, and a thorough effort made to have a reform of some kind instituted, and as Dr. Herrick has suggested, and I think that that effort has been felt in the reorganization of the Normal School at San José. The subject, in the meantime, has been growing in interest. I am practically engaged in the teaching of subjects of this kind. It seems to me, in the first place, that there is a good deal to be done towards reform in the methods of teaching these subjects of physiology and hygiene in the public schools. They, to my mind, have been taught too much as a part of the regular curriculum. They have come into competition with other subjects and studies in the course of study. Physiology has been looked upon as a science study in schools, and I believe it is necessary at the beginning to separate the two branches of physiology and hygiene. Human physiology, it seems to me, and it is the result of the experience of a good many educators, should not be taught to the younger pupils in the schools as such; human anatomy and physiology as a science study is proper, perhaps, in the grammar and high school course. But the subject of hygiene, those who are here to-day will at least admit, I am sure, should be taught from the time the child enters the kindergarten until he is graduated from whatever institution of learning, at least below the professional or technical school, he may enter. Hygiene, it seems to me, should be taught, as Dr. Herrick has suggested, as the science which deals with self-preservation, agreeable to the previous preparation and condition of the children who are being taught. A mistake has been made in trying to teach pathology to children in the first grades of school, in temperance instruction as well as in the teaching of physiology. Injury has been done by the discussing of things which have simply surprised and shocked the nervous system of the child who has never been prepared by any previous training, in the effort to force instruction of this kind. Preparation is needed before the child can understand such difficult subjects as the principles of human anatomy and physiology; there is a preparation needed before entering upon the study of animal physiology, zoölogy, biology, pathology, physics, and chemistry. But the child must not be neglected in the education which he should have in the science of hygiene or health preservation. The first thought that I want to emphasize is that it needs to be differentiated more clearly as a subject, so that it may not come into competition with, or be crowded by, or compressed with other studies in the school curriculum, because it has to do vitally with the child, no matter what he is going to do or how long he is going to stay in school, and the shorter time he stays the more necessity there is that this subject should be sufficiently inculcated.

There are certain things which it seems to me are necessary to the proper teaching, proper consideration, and proper treatment of this subject in the schools to-day. In the first place, a realization of the neces-

sity which will come with the better intelligence of people at large. This must be done by education of public opinion, an education which will grow out of this meeting, if this subject be touched upon every year, one year after another; through the discussion of these matters in the newspapers, as well as through the teaching of the younger generation, which will enable them to appreciate the necessity for it.

In the second place, I find from a study of the schools in this State, that practically the most difficult problem to-day to solve in the matter of the development of physiology and hygiene, is lack of preparation on the part of teachers. Dr. Herrick has told us the preparation given in one or two of the normal schools of the State. As a matter of fact the training given in hygiene, in health preservation, is very deficient in most of the State normal schools and universities and public schools throughout the country, and entirely inadequate. It is taught by teachers who are crowded with other work. If they teach it at all, they teach it because they are required to. They have no heart in the subject whatsoever. They teach it as an extra. They feel it an added burden, and they teach it as superficially as they can and retain their places. I have had them admit this to me time and time again. It is possible to arouse an interest in them in this work with reference to this subject, but this has not been done; primarily, because no proper training is given in the training school for teachers, neither in the high schools, in the grammar schools, in the normal schools, nor in universities; and in order that this shall be done, in order that teachers shall have the proper training, there must be better methods for the teaching of this subject. I say this subject of hygiene, which implies enough of anatomy and physiology, as well as the study of disease, to render it intelligible; this teaching, at least in the normal schools, should be done by specially trained teachers, by medically trained teachers, and not simply by physicians. I feel free to speak of this, because in a very humble way I am a physician and teacher of hygiene. It does not follow that because a man or woman is a graduated physician that he will be a good teacher of hygiene. It is coming to be an independent subject, and requires careful study in addition to the professional study of medicine. It requires a special study in itself. There are better methods of training needed; in the first place, better teachers; in the second place, a method of teaching the subject which is different from the characteristic method of teaching medicine, or different from the other studies in the schools. It is the teaching of the problem of self-preservation. It is the teaching of mechanics. It is the teaching of the study of a machine which has to be run during a certain time in the best possible way, and there is no figure, no simile which appeals to me so frequently as that of the engineer. The knowledge of the teacher of hygiene and physiology, so far as he deals with this subject in the schools, is comparable to that of the knowledge of the engineer, who must know how to run the engine most economically, perfectly, and successfully to the extent of the work which it shall do. The human body is considered by our school teachers too much as a structure with very peculiar and intricate functions, instead of a machine which must be handled according to its complexity and delicacy in order to get it to do the work which it must do.

After having presumed, in the way I have, as a young man, I am rather hoping that my identity will remain unknown, because I assure

you that I am simply in the beginning of the study of this field of education, and while deeply interested, do not mean to take the position, in any way, of feeling that my way is better than that of anybody else, but it seems to me that there are certain dangers, certain difficulties, and certain very important reforms, which should be instituted.

A LADY: In the rules and regulations of the Board of Education of San Francisco, there is one that says that the windows shall be lowered at the top, and never raised at the bottom. I scarcely found a room but what I was happy to escape from. The condition was so that I was glad to get out.

DR. W. LEMOYNE WILLS: I can hardly agree with Dr. Wood in his remarks about better methods of teaching hygiene in the public schools. In a very humble way I am a teacher of medical students, and have some knowledge of the methods pursued in the public high schools, and they have no facilities whatever. The teacher, while he has other things to do, has no material, and about once a year he goes and borrows a skeleton or a book of plates, and possibly dissects a cat or a rabbit, and calls that teaching physiology. Now, in the public school it is considered indelicate to teach anatomy or physiology as medical students study it, or as anybody else studies such a subject intelligibly; and the curse of the present day in the public schools is these cursed school books published by the State. They have at least crushed out the book monopoly and the book debauchery of school boards, but they have perpetrated upon the public school system a set of books that are neither one thing nor the other, and they have about six instead of one. These are published by the State, at Sacramento—good, bad, and indifferent. Take the book on physiology. I recollect Dr. Washington Ayer said two years ago, in discussing this matter before the State Medical Society committee, that when asked to correct and revise it, he offered to write a new book rather than correct the one that he was asked to review. We, as medical men, and this convention can do a great deal to bring the people to look upon this thing as they should, and demand that the State shall either publish better books or throw the subject open to competition of the writers of the best books in the country and the best publishers. California has done a great deal to stop this schooling monopoly and debauchery, as I have said, but they have fastened on the State schools a worse curse, and that is worthless school books.

DR. SAMUEL O. L. POTTER: My experience as a teacher and examiner of gentlemen who, in medical colleges, have been school teachers themselves, may not be out of place here. I would abolish the whole subject from the public schools. I do not see what good it is doing. Its practical result is, to give the children and older pupils a smattering of what, among other subjects, is worse than ignorance. We all remember the old saying, "Drink deep, or taste not the Pierian spring." It is peculiarly adapted to the public schools, I think, in the State of California. For years I have examined school teachers who have come to the medical college, and I tell you that not one in a hundred of them can spell, read, or write, or speak the English language correctly. The penmanship of these gentlemen who have been teachers themselves is such that when as an examiner, like Dr. Wood, there, I had every year two or three hundred of their final examination papers, it was a labor of the most onerous character to even try to decipher what was put before us. When the teachers are so, what can you expect of the pupils. The

whole tendency of popular education in our public schools is to ignore the foundation; to ignore the three R's, and to expect that by some miraculous effort, or intuition, pupils will get all that before they get to the public school; and they get a little astronomy, and a little anatomy, and a little hygiene, and a little mathematics, and a little chemistry, and a little of this, that, and the other, and they go out into the world thinking they know everything, and they don't know anything. I venture to say you couldn't find a dozen graduates of normal schools in the State of California to-day who could tell you accurately where the heart of a dog is.

HELEN MOORE: I hope even this little smattering will not be left out of the public schools. What we want is a great deal more, and as the gentleman has suggested here, and as Dr. Potter has mentioned, we need specialists in this study. In my experience as a teacher, it was a subject that interested me very much, and I wanted this subject studied very thoroughly, and I found, although I have studied the subject a great deal myself, I was wholly incompetent to teach it. Instead of dismissing it, I got a specialist to give instruction, and I found that in one day devoted to instruction in that subject by a specialist, my class would learn more than in one or two months' study in any other way. Why? Because the teacher was enabled to answer every question that the child would ask, and the result was very satisfactory in every way. Now, we need more and more instruction, and we need specialists, and I hope that when a committee is appointed by this convention to wait upon the Board of Education, they will remember what constitutes a Board of Education. They were appointed two years ago, and yet have so little to report. Then another point comes in—the home. You must remember the child gets a certain amount of instruction in school. Then, again, it must go home, and it goes to an ignorant mother, and if the child is to enjoy the privileges of education, I think the mother should coöperate with the school. Now, if we had among our inspectors what are called lady visitors, or women visitors, such as they have in Glasgow, Scotland, you would find that many of the unhygienic conditions that exist in the home could be corrected, and in that way the home would coöperate with the school. And another thing: Considering the cosmopolitan character of our city, it is absolutely necessary that we must depend upon reaching the home largely through the schools, and I think if it is the sense of this convention that physiology and hygiene should be taught by specialists, and a committee, appointed for that purpose, be appointed to wait upon the Board of Education, and then if they follow up their work, I think that we shall have the pleasure of hearing, at the Fourth Annual Sanitary Convention, a very favorable report on the subject of physiology and hygiene in the public schools.

A LADY: I am afraid I did not make myself heard, but I think this rule of the Board of Education of the city enlarges our death list every year, and I am very much interested in it. It says that the windows shall only be opened at the top and never at the bottom, and the teachers are implicitly obeying the instruction, for I visited for three weeks to find out. I would like the opinion of the convention on that rule.

DR. J. R. LAINE: I believe there is something of a misapprehension with reference to a committee that is said to have been appointed a year ago by this convention, concerning the teaching of hygiene in the



public schools. The committee was appointed by the State Medical Society. I have no recollection of seeing the names of a committee appointed by this body, but I know that the matter was discussed and know that such a committee was appointed by the State Medical Society two or three days later in this city. I wish to correct that impression.

Now, with reference to ventilating school-houses by windows. I will venture this much: It became part of my duty, about a year ago, to prepare a pamphlet directed to school teachers. In that circular I recommended what is generally recommended by not only the profession, but by architects and sanitarians who are engaged in these matters, that the ventilation should be from the top of the window. I believe the reasons are obvious and plain. The air should be permitted to come in from the top rather than come directly on the backs and necks and faces of children. It is one of those things that ought to appear reasonable without more explanation. The janitor should be disciplined by the Superintendent when teachers prove negligent in that direction. The janitor of the building should be capable of giving teachers instructions on this subject, if necessary.

Now, I, for one, although I am thoroughly in sympathy with the intent and purposes of the paper, and recognize the value of the contribution presented to us this afternoon, yet I do not recognize the present great value of teaching hygiene and physiology in the public schools as it is being done; and yet I have been amazed when going into a grammar school in Sacramento and listening to the recitations. The recitations and answers to the questions have been such as to convince me that the children could answer them better than the physicians. They could give the number of teeth and component parts of the human body with such correctness that I was astonished, and they had been taught by their teachers from text-books. They call that physiology. In addition, they had the usual diatribe concerning the evil of tobacco and the enormities which follow the use of spirituous liquors; all of which, in my opinion, except the bare mention, should have been eliminated from the text-book. I doubt if the profession will take issue with me, when I say that to impress the subject of intemperance upon immature minds, except by precept and example, is altogether wrong. Not that we want to support the liquor dealer, because as a rule the physician is the enemy of the saloonman as much as is the clergyman, if not more so. He sees the evil results of the saloon habit everywhere. The people who spend their money in the rum-room do not usually spend it upon the physician, so it touches him in his pocket, as well as in his sentiment and in his reason. Neither temperance nor chastity should be taught from a text-book. But there must be some theory of instruction in hygiene, and what shall it be? To me there is only one practical plan, and that is by the instruction of the teacher.

I remember reading at one time something concerning the teaching of the English language. Dr. Potter referred to it. The question was asked how to acquire the use of the native tongue in the best way. A school teacher was asked, and he said, "Books, books." But that does not always follow. One may acquire a great deal of knowledge, but not acquire the idiom of a language from books. What then? "Raise a child in a family where nothing but pure language is spoken; let him grow up and hear it and use it in that way, and then he may acquire the habit, and use it from habit." So it is in teaching hygiene. If

the teacher, taking the class from six years of age and carrying it along up from one grade to another, impresses upon those little minds the arts of correct living that mean self-preservation, they will learn hygiene without text-books.

DR. THOS. D. WOOD: I am glad Dr. Laine has brought out the point which he has. The trouble is we teach the children something we think they ought to know, instead of knowing what they really need. With reference to athletics, I have been very much amused, as well as interested, in seeing the attitude of some Eastern medical journals within the last two or three years on the subject of hand-ball and athletic sports. It comes within my duty to help patch up the men who are injured in the various athletic sports, at the same time to assist and try to control, in one of our institutions, these games and various phases of athletics. We forget, as physicians, when we see men injured by the excesses in certain forms of sport, certain fundamental, underlying principles and truths. We forget that it is impossible to abolish the causes of disease by statutory law. We forget that it is impossible to civilize or make the human family go through a process of evolution faster than certain forces allow it. For example, take the athletic sports of to-day; the excesses of various kinds have taken the place, in my mind, of something a great deal worse. They have taken the place of the debauches, the revelries, the ungovernable, uncontrollable expression of brute force and strength of a certain age of college students, and in a way this has been a great advance over the habits of public schools of forty or fifty years ago. Nobody deploras the evils of athletics, perhaps, more than I do. I was thoroughly opposed to a good many phases of them five or six or seven years ago, but we cannot make the world perfect in a day. These things must be governed. One of our best teachers has made the distinction between athletics and gymnastics, that gymnastic work is intended to make stronger the organism of the student. Gymnastic work has passed entirely outside of that. Its purpose is to gain a certain objective end in competition, just as much so as the gaining of money is another object. If it were possible to get the students to theoretically and philosophically do their gymnastic work or their work in manual training and derive organic physical benefit from it, we would all like to see them do it, but not until the playing instinct is civilized out of the young man or young woman—and it gets civilized out too fast in a great many cases—can this be done. Athletics must be controlled. They must be improved in a great many ways, but the minute you abolish athletics you will let in something that is a great deal worse, as the Eastern institutions will find out if they try to do it. Manual training is not synonymous with proper gymnastic training. It would be a satisfaction if a child could learn a useful art and at the same time get proper exercise and training for his bodily needs. Unfortunately the manual training work very frequently emphasizes certain tendencies which in the child will shorten his life a great deal, and it has been a mistake to try and make manual training do what it is not possible that it can do by the very nature of its work. The gymnastic training should fit the child fundamentally for usefulness in life, and if the gymnastic training is not more important than the manual training directly or indirectly to his usefulness as an industrial factor, as a healthy human being, it must give way at once to that which is immediately and practically more useful.

DR. S. S. HERRICK: I wish to call your attention to Dr. Potter's remarks in regard to the inutility or inadvisability of communicating to young pupils even a small amount of knowledge of hygiene. I think it is about time that we should realize that poetry and truth are rather antagonistic. The more poetry generally the less truth, and the reason which is applied to hygiene would have just as much force if applied to any other branch of learning; just as much force with reference to mathematics and language as to hygiene.

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### CALIFORNIA AND TUBERCULOSIS.

By D. A. HODGHEAD, M.D.

It has long been a proverb that westward the course of empire takes its way. A casual glance at the history of nations will demonstrate that in a general way from the dawn of history this has been true. The oldest records and the still older traditions place the origin of empires in the far East, thence the march is westward to India, Persia, and Egypt; northward to Greece, westward again to Rome, extending itself over the remainder of Europe to England, and making its final triumphant rally on this western continent. This advance has represented not only the onward trend of individuals and masses, but it has been coëxistent with progress, with greatness, with intellectual development.

We of California may, with entire naturalness and consistency, be disposed to apply this rule not only to America in general, but to our own State in particular. We have seen this westward drift of civilization, until upon these shores of the Pacific the marching column has taken its last stand. This point completes the circle, and in conformity with what has gone before, we might logically expect that this last triumph should be the greatest. The necessary conditions are here particularly favorable. The climatic influences are of the most invigorating character. Nature has been profuse in her decorations. There are lofty mountains, deep cañons, extensive plains, rolling hills, luxuriant vegetation; in short, everything conducive to the development of man into the highest and most nearly perfect mental, moral, and physical characteristics.

Conceding, then, for the sake of argument, as well as for the many good reasons that may be advanced, that this coast, while being the final point which empire may reach in its march, contains all the conditions necessary for and favorable to the development of the highest type of man the world has yet known, the object of this brief paper plainly becomes apparent and the questions at once arise: What are we doing, and what can and should we do to bring about this state of possible perfection?

We, as physicians, are the conservators of the mental and physical health of the people. Our office is not alone to alleviate suffering and heal disease, but to exercise as well the science of prevention. Most especially in this latter particular does the work devolve upon those composing the convention here assembled. What are we doing to aid the present generation and the future generations of California in ren-

dering this final step in the march of empire the greatest and best? I shall tell you what we are not doing. We are not giving the people of this State pure blood. We are not excluding disease. We are not exercising the art of prevention. On the other hand, we are keeping our gates wide open and extending unreserved invitation to the lame, the halt, the diseased in lung, liver, joint, and brain, to come and make one with us. We raise our hands in abject terror at cholera, smallpox, and leprosy, and extend, at the same time, an urgent appeal, a most cordial welcome to the tuberculous of all climes, classes, and stations. We deliberately invite among us those incurably affected with the most relentless, the most unsparing, the most widely distributed, and the most fatal of all diseases. To consumption, which respects neither age, sex, condition, nor locality, which claims annually more victims than any other three diseases, which contaminates the living and transmits itself to succeeding generations, to this direct enemy of the human race we extend an especial greeting. The people of this State are doing this thing, exposing to contagion the living, contaminating the tissues of those yet unborn, in order to sell a few more lots or rent rooms at a sanitarium. To such an extent has this practice been carried that residents in a large section of this State are popularly known as one-lunged.

What means it that the death-rate of San Francisco is almost equal to that of London, or that California should record a mortality as great in comparison as that of England? Would these things be if we had not attempted to make our fair estate one huge hospital for the world in general and for North America in particular? I should prefer to take my chances of living in the lowlands along the Mississippi than in the so-called choicest spots of California, where one third of the population is tuberculous. We are selling our birthright for much less than a mess of pottage. If we would respect the inheritance which nature has bestowed, if we would take proper advantage of the opportunities before us, if we would produce here the most magnificent type of mankind the world has yet known, a type in keeping with whatever else nature has here evolved in her most unstinted extravagance, we would not make of California a sanitarium. It cannot be true that the choicest spots on earth, to be found in our State, where blow the gentlest zephyrs, where bloom the sweetest flowers, where shines the balmiest sun, are fit only for the habitation of invalids. I believe we should shun and exclude a diseased lung even more readily and vigorously than a smallpox pustule or a cholera germ.

At first thought it may seem cruel and inhuman to withhold from the sick and afflicted the opportunity for health and life. But if *some* of the sick are not exempt, why should others be? Besides, for commendation we may rely upon the principle that self-preservation is the first law of nature, and for further justification, both in the face of the present generation and of those yet unborn, we may turn to the fact that excluding contamination brings the greatest good to the greatest number.

It seems to me that California has a peculiar mission to perform. She stands in a position unique and unprecedented. The climax of civilization has here been or is to be attained. In point of territory we can go no farther. It is not within the power of the earth to bestow greater natural advantages. By the short-sighted, narrow-minded, selfish policy now being pursued, we shrivel our bodies, stultify our brains, dwarf our opportunities, make of this fairest land a pesthouse, and bring upon ourselves the curses of posterity.

## Discussion of Paper Read by D. A. Hodghead.

DR. H. BERT ELLIS: It was a very interesting paper, and contains much of truth, very much of truth, and yet I think Dr. Hodghead has exaggerated it in order to bring out that point. True, we have a great deal of consumption, tuberculosis, in this State, and we are, by our methods, inviting more of it here. At the same time, we are making plans to prevent other diseases from coming, and it is the one disease from which we have most to fear. It is not the most rapidly fatal, but when we take the grand total into consideration, I think probably it is the most fatal of all diseases. The paper, as the doctor has written it, has suggested a new name for the State. We might call it the "one-lung" State, or "the State of one-lungers."

DR. J. R. LAINE: I was in hopes that the writer of the paper would suggest some plan to obviate the "selfish method" that he says is now in vogue. He said that we are pursuing a selfish course in permitting these people to come here as they do. Now, how are we going to avoid it? He has not told us. He practically left off where he began. It is easy to find fault, and I must confess I see that too frequently in bodies of this kind. Carping fault-finding is easy. To tell us we might improve, does not tell us how to improve. What remedy will we have? How are we going to prevent consumptives from coming to the State, or the halt or blind from coming here if they desire to? He does not tell us how we are going to prevent people from contracting the disease, nor how to treat them after they have contracted it. I was in hopes the doctor would indicate in some way what we should do in order to free ourselves from those things that we do not desire.

DR. W. LEMOYNE WILLS: As it seems to be the function of conventions of this kind to meet to resolve, I think a very good and practical thing to do would be to take some action in regard to the transportation of tuberculous sick people in sleeping-cars and in ordinary railway cars. I had an experience about seven or eight years ago. As soon as the man was dead, I was put off the car with his body in the desert in Arizona. The man alive was more dangerous than the man dead, but just as soon as the railroad company knows a man is dead, he will be put off, no matter where you are, in the desert or any place else, and he ceases to be a source of trouble. But alive he is a thousand times more dangerous, and we take our lives in our hands if tuberculosis is as contagious as we believe it to be, and yet consumptives are alongside of us, or over us, or with us, and we can do nothing. It seems to me sanitation ought to have some effect on travel, particularly in California, if we are going to be called the State of "one-lung."

THE CHAIRMAN: If there are any resolutions, they will come up for action at this evening's session.

DR. J. H. DAVISSON: It has been generally thought that tuberculosis kills about one seventh of the entire population of our country, and when we take this into consideration it is surely the most important subject with which we as sanitarians can deal. But many of us are on record already on this subject, and while it is not the proper thing for us to put unreasonable restrictions upon the unfortunate subject who is born without that immunity that makes him susceptible to the disease whenever he runs across it, either in the air that he breathes, or in the food that he eats, or in whatever way he may get it, the proper thing to do

is rather to teach the community and the people at large, that the proper way to deal with tuberculosis in a climatic way is in its incipency. Teach them not to send their patients to California in the second or third stage, nor to send those cases that are delicate and born without innate immunity, to our State. Teach those sanitarians that the proper thing to do is not to send people when the disease is far advanced, and teach them, as we should, that such patients die wherever they go. It is an every-day experience with all of us, especially physicians who live in the so-called health district that I do—living in the southern citrus belt, where these cases congregate—to find these patients coming from all over the face of the earth. I had a sad experience before I left home, with a patient who came from New England. He had been in Europe, and to all the resorts East, and came to Los Angeles to die there, in the third stage of tuberculosis. Such patients should be taught to stay at home. Their advisers should keep them there. The physicians East are responsible, in a large measure, for the large mortality from tuberculosis in California, as well as elsewhere, and until the profession at large is taught and understands that tuberculosis is fatal in the third stage, wherever the afflicted may go, this thing will probably continue. The patient is not so much to blame for coming. The patient should not be restricted by unreasonable restrictions. Every sanitary convention and every board of health should have this subject discussed, and should pass appropriate resolutions in regard to it; and there should be legislation favoring restriction, and that restriction should be placed upon people who deal with these patients, rather than upon the patients themselves; upon corporations, such as railroads and steamships, and thoroughfares. Restrictions could be placed upon them, as well as upon keepers of lodging-houses and hotels, and upon owners of private houses, if they fill their houses with consumptives. Certain restrictions should be placed that are rigid in that regard, and looked after by the local health boards everywhere. And we are taught also, by the very best authority on modern sanitation, that you can live in the closest relation to a tubercular patient in the third stage, if you will only follow out strict sanitation.

DR. C. L. BARD: There is one point in connection with this subject that I would like to speak about, and it is that the reputation of California as a health resort is world-wide. Desperate consumptives in the Eastern States or elsewhere often express the wish to come to California. If they could only reach California they would get well. A subscription is taken up for that consumptive; he is shipped to California, and dumped out here. In the course of a few weeks he is in a destitute condition, and attracts the attention of his immediate neighbors, and they start out with a petition, which is easily filled, because no one hesitates to sign a petition for anything, no matter what its object may be. A petition with the best names of the citizens of the town or county is presented to the Board of Supervisors. They have no other recourse. The Board allows that consumptive, who has been dumped here, enough to sustain him. He becomes an object of charity, and he becomes our charge. I think it is entirely wrong; I think it ought to be discouraged. I think it is a matter that should receive some recognition from a convention like this.

DR. W. F. WIARD: One year ago I read a paper on this subject before the convention at San José, because I was led to believe it was one of

the most important subjects which is brought to our attention as sanitarians. As Dr. Davisson says, a disease that claims for its victims one in every six or seven is something that we cannot afford to overlook. And another thing, in regard to the transportation of these people with tuberculosis in the second or third stage. I can appreciate the feelings of my friend back here, who said he was dumped out with one after traveling with him. I was appointed a delegate by the State Board of Health to a meeting of the Public Health Association which met in Montreal last September, and it became my necessity after reaching the Canadian Pacific road to travel all the way to Montreal with a consumptive. I sat close to her, and all the way I felt the weight of my expressions as given in that convention. And it is anything but pleasant to a medical man who is interested in and has examined the subject.

The question at Montreal came up in regard to the transportation. One man read a paper on the innocuous transportation of people who have died of tuberculosis and other infectious diseases. Now, some of us took the ground that they ought to be prohibited from being transported anywhere. I don't like to be hard-hearted, and I believe that no one will go further to aid and assist one of these poor unfortunates than I will myself, but I believe that it is a positive wrong to the public to allow a person who has died of tuberculosis in California to be transported back East. I do not believe it can be safely done, and I do not believe that in justice to our race we ought to allow it to be done, and I believe that when they leave their homes in the East and come out here, they ought to have it understood before they leave the East that if they die here they will have to be buried here. I happen to belong to a relief board in Sacramento, and within a week I was called to see a man who came West in the third stage of tuberculosis—if there is a third stage. He had one foot in the grave, and the other one almost, and he applied to me. Said I, "Do you want me to tell you the truth?" He said, "Yes, I do." I said, "You get back to Ohio just as quick as you can. Both your lungs are badly involved, and you are not going to live long. Get back where you can be cared for." He had no money, and it became necessary for us to put ourselves in communication with a fraternal organization to which he belonged, and we communicated by telegraph, and the matter was misunderstood, and they replied, thinking that he was dead, to bury him here. Well, unfortunately, the party to whom the telegram was addressed, took it down and read it to him. That may have had something to do with his rapid decline. It seemed heartless at first, but, come to consider the matter, I think it was a very good idea. I think it was wise counsel which dictated that reply. They said, upon conferring with his family, and with the officers of his lodge, that they concluded that the best thing to do, under the circumstances, was to let him die here and be buried here. Now, as I say, when I first read that, it occurred to me to be the coldest-blooded and most heartless thing, under the circumstances, that I ever knew, but upon further consideration, I think that if it was understood by the people who have this disease that if they came here they would die here and be buried here, we would have less of them. I don't think that this country ought to be made that kind of a sanitarium. I think it is due the people of this country that we have as good a right to life, liberty, and the pursuit of happiness, as any people in the world. We cannot have it if we admit these people. It is unfortunate they have it. It is

unfortunate that a party in the community has leprosy. They will have it once in awhile. What are we going to do with them? We cannot say that they are our brothers, and that we ought to take care of them, and let them associate with us, and have all the advantages of society. We cannot do it in justice to ourselves. Just so with the tuberculotic. We cannot afford to do it. We want to guard against these things, and, as sanitarians, we want to put our foot down on this just as we do on other things. We say to a man who has a horse afflicted with glanders, "That horse is of no use." As a State we won't pay him anything for it, and we will demand its destruction. We will put it out of the way of doing harm to anybody else. The same with a cow afflicted with tuberculosis. It is practically of no earthly value, and while the sentiment will continue to hang around a person suffering from these incurable diseases, we feel all the sorrow we can possibly feel for them; yet if they are afflicted they are in a position where they are dangerous to the public health, and we ought to, and we must, if we ever intend to stamp out this disease, put our foot right down and say, "Thus far, and no farther."

DR. C. A. RUGGLES: I have listened with a good deal of attention to this discussion. I think the keynote of the whole business has not quite been struck. I think it was alluded to by the gentleman who read the paper, and that is the boom question, in advocating the high health conditions of our State all over this country. It has been my privilege to have been East four or five times of late, and every time when a gentleman hears that I am from California he begins to talk with me about the healthfulness of our climate. Well, I don't like to say no, exactly, but when I come to question him, I find out that he and his friends have been flooded with circulars from certain portions of this country, this California, doing the very same thing that we are trying to stop—inviting them to come to California, because they would get well. A dying man catches at a straw. I have been connected with the State Board of Health for a good many years. Dr. Tyrrell was our Secretary, and he came very near being lynched—in thought at any rate—by the press of a certain portion of this State, because he advocated this very same thing, that they should not invite tuberculosis to the State. I won't mention where it is, or anything about it, but it is a fact, and nobody dare deny it, that the invitation has been thrown out broadcast all over the United States, that certain portions of this State are advantageous to the tuberculous patient, and, as I said before, the dying man catches at a straw, and he comes and dies here. Now, then, we should stop these invitations. Let the people understand that we don't want them here. Another point: After they get here and after they have impregnated, so to speak, our State with this disease, it seems to me as though there is something radically wrong in stopping it. Now, then, in the little town where I live, I enthusiastically impress upon the Board of Health the necessity of going into this restrictive business; that is to say, I instruct the public mind that tuberculosis is communicable, and therefore preventable, and in that respect we have gained one particular point. A resolution introduced by myself into our local Board of Health, provided that the physicians of that locality should report to the Health Officer the existence of tuberculosis wherever they were satisfied that it was so. In twelve months there had been thirty-three deaths from tuberculosis, and only two cases



reported to the Health Officer. Now, who was to blame? The Health Officer stood willing and ready to go and give instructions to all those poor, afflicted families as to how to avoid a continuance of this disease in their family. Not in the way of restriction, or anything like that, but by speaking to them kindly and tenderly, and showing them wherein the disease was communicable and how to prevent it, and we thought that was a very good way. I could not get the physicians of that little town to act with the Board of Health, and thirty-three or thirty-four cases died, and only two of them were reported to the Health Officer. Now, I say two things should be done: First, do not invite them here; do not let them know that this is the fairest climate the sun ever shone on, that it will raise the dead and heal the sick, and cast out devils, and everything else; and then let the physicians report to the sanitary authorities the existence of the disease, and let this thing be restricted. I do not believe in vigorous restrictive work, or treating it like leprosy or smallpox. It may be we will be obliged to, some time or other, but not yet. I believe in instructing the public mind as to the nature of the disease, and how it can be prevented, and in stopping the importation of the disease.

DR. J. R. LAINE: A little less than a year ago I was instructed by the State Board of Health to prepare a circular on the restriction of tuberculosis, for distribution throughout the State. After reading the contributions from the different States I deferred the matter and delayed it, and continued to delay it, until the present, and have not yet done so, for I found so little had been offered. It was for that reason that I criticised the paper of Dr. Hodghead, and referred to it in the way I did. I would have been glad to have had him tell us what to do. For after we go over the entire field there is so little to offer, unless there is legal restriction, and to that point the profession has not yet attained.

DR. THOS. D. WOOD: It seems to me the paper of Dr. Potter indirectly suggests one other method of dealing in a broad, general way with this disease in the State of California, and that is by the establishment of certain institutions which would correspond to the State as the hospital-room or the sick-room in the house does to the family; certain institutions, such as have been established in one instance in New York, in parts of the State which are separated from the great mass of the homes and the cities and towns in the State of California, where the conditions of climate and sanitation are more favorable for this disease than they are in the most popular resorts near the coast; where the people can be, in a way, segregated, without feeling that they are treated as the leper is, and where they can be really better treated without that danger to the rest of the people which exists at present.

DR. W. LEMOYNE WILLS: If Dr. Wood wants to make a hospital for tuberculosis, he would have to put this restriction: the restriction of Eastern people who have barely enough money to get here and be taken care of by Californians, as they are now in the southern part of the State, at the county hospital. You people of Northern and Central California probably do not realize what a tax it is upon the southern counties to take care of these people at the poorhouses and the county hospitals, which are almost wholly filled with tuberculous Eastern paupers—people who, having barely sufficient means to come, yet do so because they think it is the last hope, and they are kept alive at the public expense. The

county hospital in Los Angeles is absolutely filled to overflowing, and they are sleeping on the floor, and nine tenths of them are tuberculous patients from Eastern States, who are non-residents of California, or, at least, have been here a very few months. If you are going to begin this thing you might as well expect to get a million dollars' appropriation every year. Let all California pay it, and stop the newspaper press, because they are responsible for this boom idea of beautiful climate and perennial paradise, and all that sort of thing, and real estate sharks as well. We might as well invite the whole earth here and expect to support them. It is absolutely impossible to do it, and we in the south are bearing a great deal more of a burden than you in the north appreciate.

DR. J. H. CAROTHERS: The southern part of the State is not alone in the great burden of taking care of those persons who come here with tuberculosis, and die upon our coast. My experience as County Physician for some thirty-four years, will warrant me in saying that it is a vast expense to the people of the interior of the State, as well as in the southern portion. I scarcely remember a year, in that capacity, that I have not had one or two of that kind of patients in the hospital, who belonged in the East; and to us, people of California, it certainly is a great expense; but, in the language of Dr. Laine, what can we do? Can we restrict their immigration? I think the Constitution of the United States would prevent our even enacting a law. I think a person in one State has a right to go to another at any time he may see fit. I think something ought to be done to correct this idea of sending persons in the advanced stages of consumption to this country. A change in the sentiment of physicians themselves would be a great advantage to us in this respect, especially among the Eastern physicians.

DR. SAMUEL O. L. POTTER: The corresponding country to this in the Old World, is Algeria. The Government of France makes very strict laws, and carries them out; which, I am afraid, we would not do here if we made the laws, judging from similar experiences in other directions. But the Government of France puts very strict restrictions upon the importation of tubercular diseases to Algeria. No one who has tubercular disease can enter Algeria without being subjected—in fact, all invalids have to be subjected—to a health examination under the direction of proper officers; and those who have tuberculosis are obliged to be taken away, unless they have the means, and show the Government that they have the means, to support themselves in the proper way during the time they are there. We might take a leaf out of the book of France in this regard, and, as the General Government turns back, at the port of New York, immigrants who are unable to sustain themselves, and are apt to become a public charge on the people, so this State could easily quarantine itself against any contagious disease. It does against others; why couldn't it against tubercular disease? Before coming to that point, as Dr. Ruggles very well said, before coming to the legal restrictions, the mind of the public should be educated up to appreciate and understand what a contagious disease this is.

DR. J. H. CAROTHERS: How would you prevent the importation of tubercular persons from the Eastern States into this State under our laws?

DR. SAMUEL O. L. POTTER: The State of California, only a short time ago, placed a quarantine officer down on the borders of Arizona to prevent anybody who had certain diseases from coming into the State over

the railroad, and it could do so with tuberculosis to-morrow if public opinion would sustain the action.

DR. W. F. WIARD: If I may be allowed to add one word more, it seems to me that if we can legislate to control smallpox to prevent its spread; if we can legislate to quarantine scarlatina, the results of which are as a mere nothing compared to the terrible devastation brought about by tuberculosis; if we can control diphtheria and prevent its spread by one person going from one afflicted with it to the rest of the community, why can't we do something with tuberculosis? If it is necessary to legislate to restrict and prevent these other diseases, isn't it infinitely more necessary that we should legislate to save our people from the terrible devastation wrought by this disease? I cannot understand why we are so afraid to legislate to control this disease. I cannot understand it. We do so for other things. We all acknowledge the terrible work and ruin it is bringing upon us, and yet we must not legislate. We must wait and educate the people. We have been educating the people up to the evils of alcohol for years, and I was going to say, ages, and what are we getting? What should we do if it were not for our legislative enactments? We should sit here and do nothing, and accomplish nothing. We say to these people that if they get drunk and commit crime, they shall suffer. We bring the law to bear, and in that way we accomplish something, and we never can accomplish anything until we handle tuberculosis just as we handle scarlatina, diphtheria, and smallpox. I know it is an unpopular stand to take, and I know, as they say, the people are not educated up to it, but the fact of the business is, they will have to be educated up to it before they will accomplish anything, and these legal restrictions will have to be called into requisition before we can accomplish anything with it.

DR. C. A. RUGGLES: The public mind is not up to that point yet. Lord Bacon says no law can be successfully passed and maintained unless supported by the public. When the public mind is educated up to the necessity of restricting tuberculosis in the same manner that it is in regard to restricting smallpox and diphtheria and scarlatina, you may abolish tuberculosis. It is within my recollection that diphtheria was considered, well, not catching, so to speak, and when we undertook to start in with the restrictive process of treatment of diphtheria, we were hooted and scouted and ridiculed all over the country. But after awhile, by terrible object-lessons, the people began to see that it was contagious, and that death surely followed the carelessness of leaving it alone. The moment the public mind was educated up to that point, then you could pass any law you saw fit. I, as a health officer of my town, can do anything I see fit in regard to the restriction of diphtheria, and I have the public mind with me all the time. Why? Because they have been educated to its necessity. But let me undertake to put the same restrictive measures to work in regard to tuberculosis, and they would drive me out of town, simply because they have not yet reached that point. But I assure you that they are fast coming to it. They are very fast coming to it, and all we want is a little patience, a good deal of perseverance, and the public mind will soon become educated up to the point where we can pass a law and maintain it in the same manner as in regard to smallpox and diphtheria.

DR. D. A. HODGHEAD: In summing up, in reply to the very lengthy discussion which you have been engaging in, I want to say, first, that I have been very much gratified to have interested the convention to this extent, because I feel that it is the most important question before California to-day from a health point of view. Now, I purposely left out of my paper any attempted solution of this problem, for several reasons, but one in particular, which is, that I consider the Board of Health of this State, and others who have made more study of sanitation than I have, to be much more competent to solve this problem than I am. In reply to the question of Dr. Laine as to how this shall be done, it does seem to me that it has already been answered in the way which I favor. That is, if it cannot be effectually done in any other way, let us have it by legal restriction, and if the people are not educated up to this point yet, let us educate them. That is what we have to do. Now, if you look over the health reports of this State, you will very readily see what ravages this disease is committing upon our population. We will find that the sum of deaths from tuberculosis is greater than from any other three combined diseases in this State to-day. We do not believe that consumption is a natural product of our State. It has been imported here. It has been imported here, because we have held out the inducements. If we have burdens—as one of our members has said—if the southern part of this State is to-day bearing burdens that are heavy, the people of the southern part of the State are chiefly to blame. We have brought this calamity upon ourselves, or we have allowed it to be brought upon us. The newspapers, possibly, to some extent, particularly the local newspapers in the different parts of the State, speak in favor of that locality, because people naturally think if they can get a drift, in their direction, of people who are sick, that those people will bring money, and they will buy land. And then our real estate agents, possibly, do more than any other one influence. They have flooded all the Eastern States with their circulars, and every spot of the State, from their point of view, is a paradise. Now, without detaining you longer upon these propositions, I will simply say that the solution of the question is not only in legal restriction, if it becomes necessary, but also in stopping the holding-out of the inducement that California's atmosphere is a specific against tuberculosis. We know, sincerely, that it is not so. We know that people die of consumption here just about as readily as they do in any part of the country; and if the atmosphere of California were a specific against tuberculosis, even then we would not be justified in allowing them to come here in such numbers, or in allowing them to come here at all. We restrict other things; we restrict smallpox at the boundaries of our State, and exclude any contagious disease. Whenever a ship comes into our harbor with smallpox or yellow fever on board, she flies the yellow flag, and certainly those things have not done us anything like so much injury as this one disease, tuberculosis. That is the one thing which we have to dread, not only on account of its influence upon the present generation, but, as I said in my paper, upon the generations yet unborn.

### STREET SANITATION.

By W. F. McNUTT, M.D., M.R.C.S. Ed., etc., Professor of Principles and Practice of Medicine, University of California.

Street sanitation is a subject of vast importance to the people whose lives are spent in cities. While I feel that I need not apologize for occupying the time of this scientific association, as far as the subject-matter is concerned, I do feel that I must apologize for the incomplete manner in which I have been obliged, for lack of time, to present the subject. If, however, I succeed in doing no more than arousing the attention of some members of this learned body to the importance of street sanitation, who will, on a future occasion, do greater justice to the subject, I will feel that my hurried effort has not been in vain.

The subject of sewerage or the best sewer system for cities, I will not attempt to discuss in this connection. To maintain a healthy body and a sound mind for a series of years in one of our great American cities, is no easy task. City life has many adversities; the active man pursues his occupation under many adverse conditions, while children are beset with dangers on every hand. The unsanitary condition of our streets is a constant menace to health; they are never clean; filth of many kinds is allowed to accumulate on them. The air we breathe is loaded with poisonous materials and noxious gases; while the noises and jars of heavy teams on stone streets tell very severely on the nervous system.

No street made of poor material, badly laid, can be kept in a sanitary condition. A properly made street implies engineering knowledge on the part of the constructor and an appreciation of the fact that durability is not the only, or even the chief, quality of a good street; its smooth, even surface is absolutely necessary for cleanliness, and an even, smooth surface necessitates a thoroughly made street-bed. A hollow in a street surface is a trap for rubbish and moisture, a generator of noxious gases and destructive germs. A street surface should not only be smooth, but slightly convexed in the center, just sufficient to let the water find its way to the gutters. If on level ground, there should be a slight fall from the middle of the block each way. Water cannot remain on a street so constructed. The fire-plugs in these level blocks, instead of being placed at the street corners, as is invariably the case, should be in the center of the block. Thus situated they answer equally well in case of fires, and are available for washing the properly constructed street. Street washing is an absolute sanitary necessity, and the water answers the double essential purpose of flushing the sewers. The sewer traps at the street corners should be carefully and effectually screened to prevent, as far as possible, decomposable materials from entering the sewers. Very much of the decomposition that takes place in the sewers is entirely preventable by well-fitting screens to the traps.

Streets made with stone blocks, the spaces between which are filled with sand, are necessarily unsanitary; it is impossible to keep them clean. Decaying rubbish, manure from horses, which contains the tetanus bacillus, glanderous discharges from animals, sputa from consumptives, typhoid and cholera bacilli, etc., accumulate in the sand between the blocks, and are being constantly carried about by the wind. In this city the garbage and refuse materials from back yards and

stables, which contain the discharges from typhoid or cholera patients, or the poisonous bacilli of scarlet fever, diphtheria, consumption, glanders, etc., are carted through our streets in open, leaky wagons, leaving a trail of filth and poison. Nothing can be more criminally careless and disgusting than the manner of carting dead animals through our streets on open carts; many of them, too, having died of the most contagious diseases, their poisonous secretions being deposited on our crowded thoroughfares.

In hundreds of cases of the contagious diseases, whose source is considered so mysterious, the contagion is inhaled with the street air. The poisonous material becomes desiccated and mixed with the sand and dust of the street and whirled about by the wind.

A smooth-surfaced street kept well swept, sprinkled before sweeping, and frequently well washed, reduces the chances of street contraction of contagious diseases to a minimum. Every garbage cart should be built and kept constantly under the surveillance of our health department. All garbage should be destroyed by fire. Every city should have its garbage crematory. The dumping or depositing of poisonous garbage and refuse material within the city limits is a satire upon a health department. Every dead animal should be removed in a water-tight cart closely covered. The present revolting and dangerous manner of carting dead horses through our streets on open carts is a reproach to our health department. Some of the diseases of which these animals die are most virulent and fatal to human beings, their contagium possessing a particular enmity to man.

Another source of street contagion is our street cars and public carriages; hundreds of people with contagious diseases ride in these public conveyances. Children with diphtheria, or while the scarlet fever desquamation is in process, scatter the poisonous germs in profusion about the cars and carriages, consumptives deposit their bacilli-loaded sputa, and syphilitic patients leave the germs of their loathsome disease. It should be the duty of the health department of a city to reduce this source of contagion to its minimum. The usual washing of cars with cold water is extremely inefficient. Every car and carriage should be carefully cleaned and fumigated at least once a week.

We have as yet but one known material with which to construct an ideal street, a street that is capable of being kept in a sanitary condition, viz., bitumen.

Macadam is the best country road, but cannot be kept washed and made entirely aseptic for a city. Yet a macadam street, by being kept in good condition and well moistened, can be made a comparatively healthy thoroughfare, and on very steep grades is the only material that makes a street that can be used. Wood and brick are too porous for street material; they readily absorb the numberless poisonous street filths, and pollute the atmosphere with noxious vapors and life-destroying germs. It is possible to keep a stone street clean, by filling in between the blocks with cement or asphalt, which leaves no absorbing surface. But even cleanliness, though next to godliness, does not constitute a perfect sanitary street. There are other methods of destroying health and life than by poison. The noise and jar and rattle of carriages and heavy teams on stone streets, are very fatiguing to the nervous cells and destroyers of vitality. The excitement and turmoil and rush of a great city are enormous taxes on our nervous systems, but when

we have in addition the day and night stone-street rattle and jar, the nervous system must sooner or later yield to the inevitable. With the unrest, the strain, the fret, fret, fret of stone jars and shocks, there is no rest, no peace, no undisturbed repose, and where rest and peace are not health cannot dwell, cannot be maintained. It should be the duty of our health department to prevent as far as possible the noises, *i. e.*, air shocks and earth shocks. Nature has declared that rest and repose are essential restoratives, and that no brain can do its best work, can work to its full capacity, that has not had a few hours' rest, a few hours' freedom from air and earth shocks in every twenty-four.

Discussion of Paper Read by Dr. W. F. McNutt.

DR. WINSLOW ANDERSON: The subject of street sanitation I believe to be a very important one for the consideration of this convention. It is a fact, and I am sorry to acknowledge it, that San Francisco has almost the dirtiest streets of any city of its size in the world. The pavement is bad, as the doctor has pointed out in his excellent paper, but there is no excuse, there can be none, for keeping our streets in such a deplorably dirty condition. Every day when the winds are blowing the dust and dirt and microbes are inhaled by the multitudes on our streets. We know that disease may be communicated in this way. We know that drinking water and milk exposed to such dust become contaminated—they become disease-laden. Fresh meat, when exposed to atmosphere laden with germs, also absorbs pathogenic bacilli, and it does seem that something should be done, some attempt should be made to endeavor to keep our streets clean. I do believe that street sanitation in the manner indicated in this paper is a very important subject, and one worthy our attention.

DR. M. REGENSBURGER: Street sanitation in San Francisco could be better in many ways, it is very true. We have laws here which are never carried out. The doctor remarked in his paper that there were certain things that were not creditable to the Board of Health. I beg to differ with the doctor on that subject, for the reason that the laws have been passed by the Board of Health, but our Board of Health here is handicapped by its laws not being carried out. We simply make the laws, and the Board of Supervisors is supposed to carry them out. We have laws regarding garbage, and the removal of garbage, and that no garbage shall be removed from any house, except in air-tight wagons, so that none can escape, but as you pass the wagons it falls in your face. So the fault does not lie with the health authorities, but with the Board of Supervisors. Regarding the streets: The keeping of our streets in good condition is very simple if properly carried on, and the present system could be remedied very rapidly. I would like to remark right here, that I think Dr. Anderson is wrong when he says that the streets here are in a filthier condition than anywhere else in the world. The doctor has traveled, and I have traveled, and you take the large cities of the United States—take New York City or Chicago, and you will find the streets there in a great deal filthier condition than they are here. It is true everything cannot be done in one day. This city has, within the last five or six years, improved her streets by bituminous pavement, which is being laid all over the city as rapidly as it can, and in a few years San Francisco will be one of the cleanest

cities of the world. The question of cleaning the streets is a very simple one; that is, each individual property owner should be compelled by a very strict law to keep his part of the street clean. By this method the streets of San Francisco would be in excellent condition, and it would cost the city nothing. Simply pass a law compelling the property owners to clean the streets before their property; clean the sidewalks. We have a law preventing the throwing of garbage on the street, but it is a law that never has been carried out. Garbage is thrown all over the streets here, due to the negligence of the police department. The Board of Supervisors should enforce these laws. If our city were in as bad a condition as has been pointed out here, would not our mortality reports show the condition? San Francisco is, to-day, if not the healthiest, one of the healthiest cities in the world. The contagious diseases here are very few. I do not think that within the last year we have had more than twenty-five or thirty genuine cases of diphtheria. The same can be said of scarlet fever and typhoid fever. I do not believe in giving San Francisco a black eye—coming here and reading a paper on general sanitation, and then damning San Francisco. San Francisco is a healthy city, and one of the healthiest cities in the world, and it is a young city. If we had the proper authorities to carry out the laws, there is no doubt that there would not be a cleaner city in the world.

DR. W. F. McNUTT: I would simply say that I am very glad to hear from Dr. Regensburger that we have good sanitary laws. I had not read the laws, but I have seen the streets, and while there may be laws against carting dead horses and dead animals over the streets, trailing their venomous secretions along in the track of the cart, nevertheless it is done, and I am very glad to know that the fault must be with the Supervisors, as the doctor says that there is a law against carting garbage in that way. I think it would not be doing, perhaps, too much to interview the Supervisors a little on this subject, and call their attention to it. Perhaps if the Board of Health were to follow them up a little we could get rid of a good deal of this. I have never been on the Board of Health; I hope I never will be; but nevertheless I am very glad to know that the trouble comes with the Supervisors. We will go after the Board of Supervisors.



## EVENING SESSION.

DRINKING WATER, AND ITS EXAMINATION, CHEMICALLY  
CONSIDERED.

By PROF. A. AUCHIE CUNNINGHAM, F.C.S

*Mr. Chairman and Gentlemen:* Drinking water is a compound. No one can tamper with it with impunity. The quantity of water which enters our system daily varies from three and one half to five pints, all of which, however, is not necessarily drunk, as about one third is taken in the form of solid food. Thus, we see, an average person swallows every week about three and one half gallons of water; therefore, we can readily understand, should there be but a small trace of injurious matter present, either organic or inorganic, it would soon assert its painful effect.

Pure water is never met with in nature; the most transparent ice and the clearest rain water contain foreign substances. In fact, pure water is a curiosity in the chemical laboratory. Presenius found, on distilling 42.41 grammes of water in a glass flask with great care, that it subsequently left on evaporation 0.0018 grammes of solid residue. Mr. Crooks, in determining the atomic weight of thallium, found it necessary to distill the water in special apparatus *in vacuo*. We, however, find, when water is distilled in the usual way in properly constructed stills and condensers, made of the right material, that it answers all the ordinary requirements of the chemist. I am sorry to state that sometimes we find in chemical laboratories the distilled water being polluted by the vapors so commonly found in the atmosphere, owing to the absence of a wash bottle containing purifying chemicals, through which all air coming in contact with the water should pass. I have also seen, where an important analysis of water was being made, a wash bottle in use, the contents of which had been blown upon by the operator so long as any water could be expelled, and this same water, which could not avoid being contaminated by the breath, would be used in making the analysis for organic matter; no attempt being made to boil the water before use.

It is, however, not with pure water that this paper deals, but with drinking water. This, we find, always contains matters in solution, both gaseous and solid. Where free from the former the taste would be insipid, and should the latter be absent or only present in very small amount and not composed of the proper constituents, the number of cases of rickets would increase rapidly, as is the case in many towns where the water supply contains only a trace of lime. The quantity and nature of these matters held in solution are therefore important questions to be taken into consideration when we examine the water chemically. The quantity must therefore be determined and its nature in relation to health thoughtfully considered.

The first thing necessary in making an examination of water, so that the results may be of scientific value, is to obtain a fair sample. The bottles in which the samples are to be taken require to be not only chemically clean but thoroughly sterilized. In preparing sample bottles they should be cleaned with good water and then about two ounces of C. P. hydrochloric acid should be poured in and every part of the inside of the bottle brought in contact with it. This should then be removed and the bottle filled at least four times with good water and finally twice rinsed with distilled water. It should then be rendered sterile with steam, and a clean cork placed in the neck. During the past four months I have refused to examine five samples of water out of sixty-five sent, because after all precautions regarding cleanliness of bottles had been taken, dirty corks were inserted.

In sampling water from wells the bottle should be plunged about six inches below the surface and the cork then removed, thus avoiding all chances of surface contamination. When full it should be withdrawn, an ounce of water poured out, and corked. When taking samples from streams, all inlets and outlets should be avoided. When reservoirs or lakes are to be examined, samples should be drawn at various depths by a special apparatus, also at different parts, as well as from the bottom and surface, and one or two from any part which shows likelihood of contamination from surface drainage, which I am sorry to state I have found to be not uncommon, in one or two instances, where I took samples from reservoirs supplying cities in this State from the proximity of farm yards, hog pens, etc. Where possible, the chemist or bacteriologist should take his own samples, and thus avoid the question of an unfair sample. Should this be impossible, then the samples should be sealed and kept in a cool place until they can be shipped to the expert, which should be done without any delay. In the case of bacteriological examinations, time between sampling and inoculation of tubes is an important factor, and where this, owing to travel, would exceed the limit laid down by authorities, the expert can take his tubes along and place his drops of water in them on the spot.

For making water analyses the chemist should have a special room, free from the fumes found in the laboratory. This point is not always attended to, and I know of important analyses of city supplies being made alongside of assay furnaces in full blast, to say nothing of the ammonia bottles lying on the shelves and the dust floating about in the atmosphere.

The *modus operandi* of water analysis is well known. I will therefore treat with the results of a chemical report, and give the figures which have stood the test in epidemics where water contamination was at the fountain head, and where, when the polluted springs, wells, or reservoirs were cut off from the supply, the increase of the maladies was stopped inside of a few days, or in hours. When such outbreak occurs time is an important factor, and this is one advantage which chemical analysis has at present over the new and slower process of bacteriological examination.

A sanitary analysis of water gives these results: (1) Total solid residue, or the weight of matter left on evaporating a given quantity of water to dryness over a water bath and subsequently heated in an air bath. This residue varies with different water supplies, and all authorities agree that when this residue is under 5 grains to the gallon,

the general health of the community is poorer than in a district where the total solids is between 10 and 20 grains per gallon, other conditions being equal. However, no drinking water should contain over 40 grains of solid residue per gallon.

(2) Chlorine in drinking water usually occurs in combination with sodium. Occasionally, however, it is met in combination with lime and magnesium. Provided it be not excessive, the amount of chlorine in drinking water is in itself of little importance. The water analyst, however, resorts to measurements of chlorine in water because its presence is, in some indirect manner, an indication of sewage contamination. In the first place, natural water which is uncontaminated with sewage is often almost free from chlorine; secondly, urine and sewage are, comparatively speaking, highly charged with chlorine, which usually exists in them in the form of common salt. It must be borne in mind, however, that animal and sewage contamination is not the only source of organic pollution. Vegetable matter is undoubtedly to be avoided in drinking water, and against this form of contamination the absence of chlorine is no guarantee. It is my opinion that too much stress has been laid on chlorine in drinking water, for it is by no means rare to find a large amount of chlorine in good water. Therefore, 5 or even 10 grains of chlorine per gallon is not an absolute bar to the use of a water for domestic purposes, but only a reason for suspicion under certain circumstances.

(3) Organic matter. The determinations of total solids and chlorine in drinking water are of secondary importance in comparison with determinations of organic matter in drinking water. The examination for organic matter has undergone many changes, and it is but a few years ago that we estimated this by combustion of the total solids and considered the loss as organic matter. To-day, however, this is divided into three branches: First, free ammonia; when a water yields over 0.08 part free ammonia per million parts, it almost invariably proceeds from fermentation of urea into carbonate of ammonia, and is a sign that the water in question consists of dilute urine in a very recent condition. Second, of albuminoid ammonia; when this exceeds 0.1 part per million and the free ammonia is low and chlorine is absent, it is indicative of vegetable contamination, and such water is very injurious to health. Third, and last, we estimate the oxygen consumed by moist combustion. This in a general way may be laid down as approximately equal to the weight of organic matter in a million parts of drinking water. And when it exceeds three parts per million, it may be classed as filthy water, and, according to Wanklyn, should be condemned.

#### DOMESTIC WATER FILTERS.

I have presented to you the safe points in the examination of water chemically, and we are now confronted with the problem of purifying water which exceeds the standard limits at the reservoir. This process of purification is termed filtration, and the good results obtained on a large scale by the use of sand and gravel have led to the manufacture and employment of many makes of filters for domestic use. Much attention has been given to this subject by many of our greatest chemists, and the rush for wealth has made the unscrupulous place upon the market a variety of makes, using, for mercenary motives, the

names of prominent scientists, without their instrument having the slightest claim to the name of filter. We therefore find many different forms of filters, using as mediums of purification stone, both natural and artificial, paper, asbestos, cotton, sand, gravel, and charcoal. Time will not permit me to give all the results of my work upon filters, and I shall simply relate in a general way what I have obtained, for the benefit of the public, so far as health is concerned, by an examination of the three leading filters which are for rent or for sale in our city. These are "The Superlative," "Pasteur Germ-Proof," and "Rapid Safety." In each instance I was kindly supplied by the agent with their particular filter.

The "Superlative" filter uses carbonized cotton fiber as its filter medium, which substance they claim is absolutely germ-proof. My results led me to believe that while the suspended inorganic matter was removed the matter in solution was increased, and upon examination I found that increase in weight was due to iron from the metal of which the filter is constructed. The tests extended over a period of two weeks, during which time five gallons of water were run through it daily and twice in twenty-four hours a sample was tested for iron, and in every instance it was found. Regarding the claim that the carbonized cotton fiber is germ-proof, I have no desire to contradict, but I must state that the water which passes through that carbonized cotton fiber was anything but free from germs when tested.

The "Pasteur Germ-Proof" filter is used by a number in this city; and as it is claimed to be a germ-proof filter, I examined it with an especial interest. The substance used to remove suspended matter and germs is an artificial stone, said to be made from kaoline, and, so far as I can learn by reading the printed matter obtainable, this filter was invented by Dr. Charles E. Chamberland, in Pasteur's laboratory, and the name "Pasteur" is being used to give the filter a standing. I have seen a list of names of persons who recommend this filter, among whom are several physicians having large and lucrative practices. I have read in the daily press reports of public lectures in which this filter was praised for being germ-proof. Therefore, gentlemen, when one cannot even take the ferry over the bay without seeing one or two of these filters, I expected wonderful things, and I must confess I found them. The results of my researches, extending over a period of several weeks, show me that the claim made by this company in regard to the ability of this filter to remove from water all matter in suspension, both organic and inorganic, is not true, and that while the suspended inorganic matter is removed, the suspended organic matter passes through. In regard to the claim that this filter is germ-proof, I tested it with a sample of water, the standard of purity of which just exceeded the limit necessitating its condemnation for domestic purposes. Pure, distilled water, free from ammonia, was used, to which I added sufficient stale urine to make the free ammonia exceed 0.08 part per million, and the albuminoid ammonia over 0.1 part per million, while the chlorine in the sample was made up to 12 grains per gallon. This solution was placed in a clean, sterilized bottle; a sterilized bougie, or candle, was introduced and attached to the arrangement known as "The Tourist" filter. Every precaution was taken regarding sterilization. The suction pump was worked, and in a short time my bottle was full of filtered water, which was corked with a plug of cotton-wool singed and coated

with paraffine wax, and laid aside for four days. I then took another sample of the filtered water and estimated the free and albuminoid ammonia and chlorine, and found them practically the same as before filtration of the sample. I then made a series of tests with acid sulphate of quinine in a solution of such a strength that analysis showed 0.5 part of albuminoid ammonia per million parts. And after filtration, this solution yielded 0.49 part per million. The same results were obtained when hydrochlorate of morphine was used. I then tried it with a solution of flour, with the same result: no improvement. At the end of four days, the sample which had been thus filtered with dilute urine was found to be cloudy, and, upon microscopical examination, magnifying three hundred diameters, I found it to be teeming with bacteria. This test I made six times, with the same result. Some of the samples which had passed through the filter were then handed by me to Professor Bowhill, of the Veterinary Department of the University of California, with the request that he make photographs of the bacteria in the sample; and, gentlemen, here are the results. The pressure employed during these experiments was only fifteen pounds to the square inch; and with these results I would like to know what would not pass through the bougie, or candle, of this so-called germ-proof filter, when attached to the water-main pressure of the Spring Valley Water Company, and using tubes which had only been scrubbed with a brush and not sterilized; remembering, at the same time, that, roughly speaking, the effect of filtration is almost inversely as the speed at which the filtration is effected?

Finally, the "Rapid Safety" filter was tested. This differs from the last in that it is a percolating filter, and uses animal charcoal as its medium of purification, which, according to authorities on the subject, is only equaled in filtering qualities by magnetic carbide of iron and silicated carbon. As a decolorizer and absorbent of gases, according to Professor Wenzell of the Pharmaceutical Department of the University of California, this substance is the best known. But with this good quality, if the circumstances and conditions are properly applied, and while all organic and inorganic matters in suspension are removed, the organic matters in solution, to a certain extent, pass through. At the beginning of my paper I demonstrated how pure water is a curiosity, even in the chemical laboratory, and while conceding the wonderful properties of charcoal in the filtration of water, yet animal charcoal is, as before said, incapable of removing all organic or inorganic substances in solution from water; and therefore, the claim, as it relates to matter in solution, cannot be maintained. In subjecting this filter to the same test as the Chamberland filter, I found, in the first place, all color had been removed from the water; secondly, all matter held in suspension was removed; and third, when polluted water, made up of quinine sulphate and morphine, was passed through, the albuminoid ammonia was reduced from 0.15 to 0.08 part per million in the former, and from 0.16 to 0.086 part per million in the latter, thus proving that the polluted water was purified so as to be fit for drinking purposes. When a solution of urine yielding 0.15 of albuminoid ammonia and 0.16 of free ammonia per million parts was tested, the albuminoid ammonia by analysis was reduced to 0.08 and the free ammonia to 0.04 per million parts, thus demonstrating that water contaminated with sewage from inhabited districts or with vegetable matter, so that it is beyond the

standard of pure drinking water, to a limited extent is rendered fit for drinking by passing through this filter. When I examined the water for bacteria, I found them present, but in much smaller number than in the filter of the Pasteur Germ-Proof Filter Company.

The liability of filtered water to contamination by air I demonstrated by charging my room with various gases and testing the water drawn from the filter, and finding their presence. I then made some experiments on the principle of the Dr. Butler sterilizer, and I found the water free from these gases. I can therefore recommend this method for sterilization of air before it comes in contact with the filtered water. The importance of this matter can be readily understood when we recollect the results in surgery since Sir Joseph Lister propounded his belief in the destruction of organic germs by antiseptants.

#### Discussion of Paper Read by Professor A. A. Cunningham.

DR. SAMUEL O. L. POTTER: Mr. President, I had a personal experience some years ago, when serving in the army in Utah, in regard to drinking water in the mountain regions, and its subsequent purification by natural processes, which, though it really has no connection with the subject-matter of the paper directly, may, in a few brief words, be mentioned, and may prove interesting in this connection. It is one in which I was much interested at the time. Here [referring to drawing made on blackboard] we will suppose to be the highest point of the Wahsatch range, up near the celebrated Emma Mine. In crossing this range we found that that high point was covered with a field of snow. The trail led over that snow field, and, of course, animals passing on the trail dropped their excreta upon the snow, and when you came to examine the snow field itself, it was found to be covered on the surface with innumerable flies and other insects, so as to make it quite black when one got close up to it. Now, from this snow field ran this little trickling stream that falls into a pool of water. In this particular place this first pool was quite large, and from it came out another stream, and there was another pool below that, much larger, forming what was called a lake, and another one below that. In fact, there were seven of these, and they were called Lake Mary, and Lake Martha, and lake something else, all the way up, as it went up the mountain chain. Now, from the lowermost of these lakes ran down the cañon a large stream of water, and joined the main stream fifteen miles off—the Jordan River. On its way down through that cañon it was dashed against rocks, thrown up into the air as spray, over miles of cañon. Now, what was the result? This water was poisonous. The contamination of the water was so great that those who drank it were sure to get what was known in that country as the mountain fever—that fever which you know gave rise to such a great argument a few years ago between Dr. Bartholomew and Dr. Woodward of the army, upon the subject of mountain fever, or typhoid malaria; that is to say, whether it was malaria or typhoid, or typhoid malaria. At any rate, the fever is well known, and in my belief it comes from the drinking of this poisoned water in the higher altitudes. But when this stream comes out of the cañon into the valley, it is used by all the farmers for drinking purposes, and is perfectly satisfactory. It is conducted into the City of Salt Lake, and is well known as delicious water, and considered as good drinking water as any city in the country has. What is the reason?

The course down that cañon, the driving of it against the rocks, and throwing it up into the atmosphere, and the shifting and moving of the water, and exposing it to the oxygen of the air, have destroyed that organic matter which it got from the snow, from the innumerable insects which were deposited there, and from the animal excreta of horses, mules, and other animals crossing the trails. Now, the practical application is that the higher you go into the mountains the worse the water, which is contrary to the general belief, that the pure mountain water ought to be the most pure. I thought perhaps this little bit of personal experience would interest you, in connection with the paper.

DR. J. T. McLEAN (of Alameda): I had an experience yesterday that bears upon the subject of the paper just read, and concerning which Dr. Potter has made some remarks. I happened to be in the City of Alameda, across the bay, and it was reported to me that a case of typhoid fever had presented itself in our community. I make it my business to visit such cases as are reported, in order, if possible, to ascertain what is the local cause, if the cause is local, for the production of typhoid fever in our city. The city is supplied with artesian water. The principal supply in the city comes from beneath a number of clay beds from 75 to 200 or 300 feet deep, and is supposed to be chemically pure. We have had it analyzed by Professor Rising, State Analyst, who is also Professor of Chemistry at the State University, and he pronounced it very excellent water. The patient who had typhoid fever was a member of a family in humble condition, near town. His parents were Portuguese. I found that they were drinking surface water, water that came from about 10 feet below the surface. They live near the marsh, where the water comes nearer to the surface than it does in the central parts of our town; but the great body of our people have discarded surface water and use the city water, the artesian water, and use it with immunity from any unpleasant or unhealthful consequences. I asked the father of this family why he was using surface water. He said he had tried to get the water company to put a pipe from an adjacent street down to his house, perhaps 300 or 400 feet away, without cost to him, and they wouldn't do it, and he didn't think it was profitable for him to do that at his own expense in order to furnish his family with pure water. I said, "Now you have a doctor's bill, I don't know how much it will amount to, for this case of typhoid fever in your family, and I attribute the presence of typhoid fever here to the use of this surface water. Unless you avoid it you are bound to have disease, and you had better get the city water brought down to your house and save doctor's bills in the future. Use this for your garden." The rule, of course, is a well-known one, that in any aggregation of population in cities of any extent, any number of people, it is unsafe to use surface water; and yet you will find many people who will say to you that they have the best water in the community, who may be using surface water. Sanitarians advise the discarding of the use of such water unless it is boiled previous to being used for domestic purposes. I do know of another case, perhaps three or four weeks ago, of typhoid fever in our community that had another origin; but it is interesting, perhaps, to know such things as these as are occurring to health officers, and so I think it would be profitable to mention this other case. A boy, 13 or 14 years of age, was reported to me as having typhoid fever. I inquired into the case, and found that his father did not believe in vaccination.

The man thought it was an outrage to have his child vaccinated, and as the boy could not go to school in our city unless he was vaccinated, his father, who didn't want to keep him out of school, sent him to Berkeley to go to school, and he got typhoid fever by going to Berkeley, and that is the pay this narrow-minded father got for not submitting to so proper a rule as vaccination of children in order to keep them from smallpox.

DR. MARTIN REGENSBURGER: The remarks of Dr. Potter bring forth a little controversy that we had here recently. It may be interesting to country members. Some time ago there was quite a hue and cry about the contamination of San Francisco water. It was contended that the watershed of Lake Merced was contaminated by live stock, and one hog pen, which I saw, contained about five hundred hogs. One of the main supplies, Lake Merced, flowed through this hog pen. The water was examined. The filth was something terrible at the time. The stench was something fearful. There were cartloads of swill from restaurants dumped there, and the water flowed through that also. I at first said it seemed a horrible thing to think that the people of San Francisco were drinking that water. Bacteriological and chemical examinations were made of the water for about one hundred and fifty yards after it left the hog pen, and the chemical analysis was almost *nil*. There was some substance in the water. The bacteriological examination disclosed some bacilli, but they were not disease-breeding bacilli, and when the water of the lake was examined it was found absolutely free from any contaminating bacilli at all. So it goes to show that even with the microscope and chemical analysis we are not always sure of the existence of disease in the water. Regarding the filtering of water: Even should the water be thoroughly filtered—I didn't hear the paper; I came too late—I have always contended that filtered water cannot be made absolutely pure; that the only way we should drink water is by cooking the water, boiling it. I have preached that right along, and am always very glad when I can say it over again. A great many of us are misled by the filter. I have had an experience regarding infection from filtered water. I contend that if water has been contaminated before it goes into the filter, if there are typhoid bacilli or cholera bacilli in that water, they go through the filter, and the probabilities are that you will find the same bacilli after the water has gone through the filter, even through the Pasteur filter, which is supposed to be the best filter. And, therefore, I would not have it go out that filtered water is absolutely pure water. In my mind there is no water absolutely free from danger, except that which has been thoroughly boiled.

DR. GEORGE W. DAVIS: The infection of water for domestic use is certainly a subject that should occupy the mind of not only sanitarians but of every physician as well as layman. We are always interested in the question of water. It is a question to which my mind and attention have been very forcibly and frequently directed. I am very glad that Professor Cunningham gave his experience, or rather, his analytical experience, with filters. I believe that filters of most any kind are beneficial, some, no doubt, more so than others, Dr. Regensburger to the contrary notwithstanding. We find with the Pasteur filter, for instance, after two or three days of use, that it is coated from one sixth to one eighth of an inch, and we also find it exceedingly difficult to wash that out; that we have to take a brush, and sometimes use sapolio, which I have done, to get rid of it, and in that filter we do not get rid of all the



typhoid bacilli and other germs. We certainly get rid of a great deal of matter. I am also glad to hear that charcoal is superior to any other medium of filtration. I certainly agree with the professor in that respect. But the drawback, I think, in the charcoal filter is the difficulty in keeping it clean. For laboratory use, or for hotel purposes, or for people who are able to have servants to attend to it, or, as in the case of the "Rapid" filter, where they take care of this dirt, it does very well; but for family use, and especially for poorer families, it is not always applicable. I would call attention also to another filter that I am also using, and that is the natural stone filter, instead of artificial stone, manufactured, I think, in Brooklyn, New York; I am not sure. I have found it exceedingly useful, and in a microscopical examination—of course it has been very limited—I have found, I think, fewer of the pathological germs than pass through the Pasteur filter. When it comes to boiling water, that is all right; I believe in that, but we know that it cannot always be done; it is sometimes impossible to do it, and therefore I think we ought to encourage other means of having pure water for domestic use than that of boiling, when it can be done. Then we must take into consideration the question that Professor Cunningham has so clearly emphasized, of the contamination of water by the atmosphere. If we do not provide means for preventing contamination by the atmosphere, boiled water is no better than any other kind of water. These are all questions that come up, and I think this convention, if it can clearly emphasize or clearly illustrate the great importance of clear, pure water for domestic purposes, our meeting will not have been in vain.

DR. H. N. ROWELL: Without further trespassing upon the valuable time of this convention, I feel that after the remarks of my venerable friend, Dr. McLean of Alameda, the fact of my residence in Berkeley may perhaps be deemed an excuse for my saying something. I happen to be the Health Officer of Berkeley, and in that capacity am often called upon to deal with some of Alameda's sick people who come to us. We have had considerable typhoid fever, I admit, and in that regard I have been greatly interested in the paper presented by Professor Cunningham this evening as regards water. The water supply of Berkeley comes from three sources: one from a reservoir in the hills, the second from a reservoir farther in the direction of Alameda, and thirdly from wells. In the last four or five years it has been my fortune to have made several analyses of water, and to be brief about it, and not to consume your time, I wish to say that, whether it is a coincidence or not, out of upward of one hundred cases of typhoid fever I have not had one case, or had reported to me one case, in which I could not trace the direct contamination to a well. Do not misunderstand me that I say that every case has been where there has been a well on the premises, but on following up the environments of the patient, the surroundings of the school where he or she had attended, I have found that in every case there has been either well or spring water used for drinking purposes. I have nothing to say on this case, whether it is a case of sequence or mere coincidence, and I leave it to you gentlemen to determine.

DR. SAMUEL O. L. POTTER: I would like to ask the members of the convention if they ever heard of a Chinaman having typhoid fever?

DR. ELLIS: I have.

DR. POTTER: Some years ago an English physician published in "Braithwaite's Retrospect" an account of Pekin, in which he stated

that there was no sewerage in the city; that all excreta were thrown on the earth; that the water flowed along the sides of the sidewalk, and from this water they took all the water they used for drinking purposes, and yet typhoid fever was unknown in Pekin. I know, myself, it is very rare. I have talked a good deal among Chinamen on the subject. It is a very rare disease among them, and you must remember that the Chinese never drink water. They boil all their water. You cannot make a Chinaman, who is sane, or carries out the adage of his race, drink anything but tea under all circumstances—either that, or boiled water.

A. A. CUNNINGHAM: I do not think, Mr. Chairman, and ladies and gentlemen, that there is very much discussion called for. The only point I would like to make is in regard to the statement made by Dr. Regensburger in connection with the water of San Francisco, when chemically and bacteriologically considered. I am not a bacteriologist, but I have had a little experience in company with Professor Bowhill, where we have been examining bacteriologically some dozen samples of drinking water from various places within a radius of fifty miles of San Francisco. I would state that I have found from our experience, and from all the authorities that I could lay my hands upon, that it is utterly impossible to state, within a period of two weeks, that there are no poisonous germs in water. Before you can demonstrate that bacteria in the water are poisonous or not, you must separate them and go through a long period of innoculating some of the lower animals, such as guinea pigs, etc. At present, there is a series of examinations going on upon some waters, to decide the question as to whether they contain poisonous germs or not. I have been interested in these experiments for the past six weeks, and am not able, along with my colleague, to state definitely whether the water contains poisonous germs or not. Therefore, I am of the opinion, as a scientist, that it is utterly impossible, in the period of two or three weeks, to state that the water of Lake Merced, or of any other place, contains no poisonous germs.

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### "THE IDEAL CITY,"

As Viewed from a Sanitary Standpoint.

By W. T. BURRELL, M.D., of Stockton, Cal.

*Mr. President, and Gentlemen of the State Sanitary Convention:* It may seem to you a burlesque on mature learning to see a young person address an assemblage of learned men, the majority of whom have passed the meridian of life, and many with reputations extending from one ocean to the other; but an infusion of young blood into any gathering can bring about nothing but good, by helping to free the mind from the slavery of tradition, and diverting attention from time-worn paths; and it should be remembered that a man's best efforts are often during youth, before the mental and physical powers reach their zenith. We look for some verdancy in youth, and are surprised when it crops out in old age, but we see it every day proved that a man is no *less* a fool because he is an *old* fool.

From the earliest ages, according to the records of geology, human beings have congregated in greater or less numbers, and as civilization has advanced, so have great cities been evolved from a mere aggregation of tents, or a group of leafy huts, until the modern municipality is a seething mass of humanity and a complicated network of mechanical devices. There is nothing more interesting to the average person than suggestions regarding the future state of affairs, and as a sanitarian I shall shortly speak of some of the probable improvements that will be made in the near future in most all large cities of the civilized world. Naturally, however, we first wish to look over the past history of man's development, and see what the formation of a city actually means, and how brought about.

Man showed the same general traits that other animals possessed, gathering in numbers for mutual protection and companionship tens of thousands of years ago. We find human bones and implements in surroundings which indicate their existence during the pre-historic quaternary and neolithic periods; and, as we follow the devious pathway of uncertain records down through the mystic ages of the past, we arrive at a period of authentic history. We know of the high state of civilization that existed in ancient Egypt, Assyria, and later in Greece; and we read of the founding of the great city of Babylon, by Nimrod, in the twenty-second century before Christ, soon followed by Thebes, beautiful Nineveh, and others whose ruins are still visible to sight-seers. Since then the progress of civilization and evolution of centers of population are matters of unquestionable record; but the facts regarding sanitary science are very meager up to the last few hundred years, so that sanitation may be regarded as a modern science—the outcome of necessity.

As a natural sequence of the change from a limited and primitive settlement, where nature had sufficient power to overcome the deleterious results of the life of man by pure air, water, and abundant soil, to the great cities of to-day, there have arisen most serious questions as to the best methods of overcoming the dangers arising from the waste products of the living. If there were no cities there would be no sanitary science necessary to aid in the maintenance of ordinary health, but the conditions as they are necessitate boards of health and health officers to labor for the suppression of epidemic and endemic diseases, and that also means, as you well know, the expenditure of immense sums of money annually. It is only necessary to look over the statistics of mortality in the great cities of the world to see the decided changes brought about by the enforcement of sanitary measures, the most important being the disposal of sewage and other refuse to protect the city from self-infection, and quarantine, to protect it from dangers from outside sources. Judging from those who have occupied the floor before me, it seems to be the fashion for the speakers to relate their experience as sanitarians, so I will modestly state (to be in the swim) that three years ago, when I was a member of the Board of Health of Stockton, the little city which I have the pleasure of representing, I had an opportunity to see what decided changes are produced even in a small place by enforcing sanitary rules and regulations, and especially by establishing a complete system of sewerage. This brings about greater confidence of the people in their town as a residence place, besides beautifying the town and enhancing property values.

The ideal city is a thing of the indefinite future, but it is by no means an impossible creation; still it is doubtful if many towns of to-day will grow into municipal perfection, for, like individual men, they are more or less dependent on circumstances. Location is the prime factor, and the future of a city depends greatly on the foresight of the founder, who, if he has judgment enough, will choose a location where drainage will be natural and climate agreeable, as far as commercial interests will allow. However, it is not usually an individual who founds a city, but it is the result of a natural growth as the resources of the surrounding country become known and used. Cities are no longer formed under the same circumstances that they were during the infant stage of the human race, when mutual protection was the guiding instinct; now the location of a town depends on natural agricultural or commercial advantages, and it is only after the population increases to a considerable extent that the health and general well-being of the people need supervision. San Francisco, in which we have the pleasure of meeting to-day, enjoys wonderful natural advantages of position and climate, and should be an ideal city according to the sanitarian's view, but it has the common afflictions and shortcomings of all large places—as Dr. McNutt just said in his paper—that it is one of the dirtiest cities in the world; however, considering the fact that it is a mere infant, as compared with other municipalities, in age and experience, it is in a promising and quite satisfactory state of growth and improvement. Its numerous hills are most favorable for natural drainage, and its equable climate unfavorable for the decomposition of refuse material. Incoming vessels can be easily quarantined, and cases of infectious diseases isolated without much trouble.

The direction of streets is determined by rail or other roads, or waterfront position. The future city will have streets of a nature to produce as little noise as is consistent with traffic, by bituminous or other smooth pavement, and only a few cobblestones will be preserved as relics of a barbarous age. Economy in conveyances will be as marked as the salutary effect on the nervous system of the city inhabitant. Good thoroughfares will be the result of a demand from cyclists and other travelers; indeed, there is no one class of people who have brought about a greater improvement of roads than the wheelmen, for still more improvement is a necessity as well as a luxury with them. Any observing person can see the injurious effect of bright sidewalks and paved streets on the eyes of children, and also of adults, and I believe that the glare of reflected light from these pavements is as responsible for so many children wearing glasses as is a poor light in the home or school-room. What is the remedy? It is simple and cheap. A dull coloring and sandy finish will mitigate the evil 75 per cent. Dark brown and chocolate colors reflect but little light; and also blue or yellow, if combined with a rough finish, reflects comparatively little. The overhead trolley system of electric cars will be relegated to the past within ten years, and their place supplied by underground conduits and compressed-air motors. Horses will be abandoned in cities and used only in frontier territory, and their place be filled by the monocyte, bicycle, and electric conveyances, bringing about more rapid and economical transportation with less noise and more safety to the traveler. If any one regrets the inevitable fate of the horse, let him go into the commercial streets, or almost any place in a great city, and see the labor that they undergo and the abject slavery

which they represent, and he will then welcome mechanical power, if only to please his humane sentiment.

Sewage disposal is perhaps the most serious problem that confronts the modern sanitarian. The mere carrying off of waste products to a dumping-ground, or emptying of the same into river or lake, will be followed sooner or later by pestilence and death. Owing to the unfavorable location of some cities the carrying off of debris necessitates the solution of great engineering problems. The chemical precipitation establishments, portable garbage engines, pumping stations, sewage farms, etc., are all the products of necessity and answer their purpose with partial success. Eventually the disposal of sewage will resolve itself into those methods which can be operated at a profit, the most promising being sewage farming, and all waste products which cannot be utilized for agricultural or commercial purposes will be destroyed by fire.

The disposal of the dead will resolve itself into a universal method of cremation, which alone is worthy of modern civilization. The contamination of air, water, and soil, by cemeteries located within the limits of a city, will no more be tolerated one hundred years hence than would a pesthouse to-day. Cremation was the practice of a large portion of the early nations, and we are just now seeing and utilizing a great sanitary truth which was an every-day fact with people who did not boast of our civilization. History repeats itself in civil as well as in political life. As the earth follows its path around the source of light and heat and comes back to its starting point, so we, too, travel along the tedious road of experience until we come back to the very same starting point in many ways and things, even though we do not wish to admit the same. It is dust to dust sooner or later, and it remains with us to assist nature in bringing about the dissolution of man's body in a clean, rapid, and sanitary way, and by so doing we trample on no rational religion, nor crush the tender sentiments of bereaved relatives and friends.

Why, you may say, can we expect municipal perfection, when outside of the electrical and a few mechanical features we are but little in advance of such civilizations as Nineveh, Babylon, or Thebes of four thousand years ago. We are a vast improvement in a sanitary way, and sanitation is what we are discussing in this convention; but perfection will never be attained. Before the millennium (so called) is reached, this earth will be a dead world like the moon. For untold ages after the human family ceases to exist, this planet will continue to follow its endless path around the dying sun—a chill, grim monument to the folly of man! Whatever we speak of in this line of thought is only relative. I can prophesy—can give you my ideas, and they are as good as any one's, so far as we can prove. The future is unknown, therefore I can prophesy what I wish, and who can say no? You see, gentlemen, this is a very safe subject to talk about; in fact, any topic dealing with the future renders one secure against criticism that can be proved, and it so occurs with this subject—if I don't happen to know what I am talking about, neither do you—so there you are!

We doctors, and especially those interested in sanitation, are a most paradoxical set of men, who labor for our own extinction by the annihilation of disease whereby we make our own daily bread. If man ever reaches the millennium (and he never will) there will be no doctors

known. Disease will be annihilated and death be a natural dissolution of old age, or else the result of accident. Sanitary science is the redemption of the physical world—it will cause the selective diseases to die for want of food after consuming the weak, and the fittest will survive and flourish, meteor-like, before they start on the downward path of dissolution, which is the ultimate fate of the human race.

### IS TUBERCULOSIS OF CATTLE COMMUNICABLE TO MAN?

By C. B. ORVIS, D.V.S., of Stockton, Cal.

In the subject, "Is Tuberculosis of Cattle Communicable to Man?" it is presumed to be conceded that the contagion of tuberculosis is linked to the bacillus tuberculosis, and without it there can be no tubercle, and that the bacillus of the ox is the same as the bacillus tuberculosis of man. We therefore deem it proper to consider, first, the three most common probable modes of infection, and second the probability of infection from each of them. The modes of infection are chiefly:

- (1) Through the consumption of milk from tuberculous cows;
- (2) Through the consumption of tuberculous meat; and,
- (3) Through the inhalation of dried excretions floating in the air that emanate from the animal body.

#### COMMUNICABILITY OF CONSUMPTION THROUGH THE USE OF MILK.

I deem it unnecessary to bring to your minds evidence to prove the existence of the bacillus tuberculosis in the milk of cows suffering from generalized tuberculosis, or tuberculosis of the udder.

In the experiments conducted for the Trustees of the Massachusetts Society for the Promotion of Agriculture, from the microscopic examinations of the milk of thirty-six tuberculous cows, the bacilli were found in twelve of them, or 33½ per cent.

In milk taken from a tuberculous udder, the bacilli are very plentiful. It is granted, then, that milk from a cow with generalized tuberculosis, or tuberculosis of the udder, is infectious. Estimating from the researches of others, it would seem that 15 per cent of all dairy cows are tuberculous. In 33½ per cent of tuberculous cows, the bacilli of consumption are found in the milk, without considering those where the udder is implicated.

For the sake of argument, we will say that this class (namely, the ones in which the gland is affected) comprises about 1¼ per cent more, making 35 per cent of diseased cows that transmit the germ to the milk. Now, then, 15 per cent of cows are diseased, and 35 per cent of this number give milk containing the bacillus tuberculosis. This would indicate that 5¼ per cent of all milch cows transmit the germ of the disease from their own tuberculous bodies. Therefore, one cow in every eighteen is giving poisonous milk, and that poison will certainly reproduce itself and cause its own specific lesions, if deposited in a suitable medium. The ratio of susceptibility between animal and man I have been unable to determine, but that certain persons and animals are more susceptible than others, there is no doubt. The amount of virus

entering the body has also much to do with the likelihood of infection. In the experiments for the above-mentioned society, in feeding calves and pigs upon milk from tuberculous cows, the percentage of infection in calves after a period of from four to seven months was 33 per cent, and in pigs 50 per cent, while of rabbits that were killed after being fed upon diseased milk for four weeks, only 2 per cent were found tuberculous. These subjects, it must be remembered, were selected with the greatest care, so that none but strong and vigorous animals would be used. It must also be remembered that they were fed only on tuberculous cow's milk. From the above experiments we should expect a large percentage of infection to children and others who use a considerable quantity of milk. Whether the human family is as susceptible to the disease as the ox, I cannot positively state. Is not the infant as susceptible as a selected healthy pig or calf? From 33 to 50 per cent contract the disease when fed upon tuberculous milk. Would it not be well, then, to be sure that your family cow is free from the disease? The communicability of tuberculosis by the use of milk has been demonstrated by actual experiments, to the entire satisfaction of such German investigators as Klebs, Gerlach, Peters, and others, and of such American investigators as Law, Salmon, Smith, Pearson, and others, and it has been proven, as I have already explained, that milk contains the bacilli in a large per cent of cases, even though the udder may not be the seat of disease.

To obtain an opinion from physicians and veterinarians, Harold C. Ernest, M.D., sent out circulars to eighteen hundred practitioners who were thought to have enough experience to make their observations of possible value. The circulars were sent out for the Trustees of the Massachusetts Society for the Promotion of Agriculture, and were as follows:

HOWARD MEDICAL SCHOOL, BACTERIOLOGICAL LABORATORY, }  
Boston, January, 1890. }

DEAR SIR: It is desired to obtain the following points: Have you ever had a case of tuberculosis which it seems possible to you to trace to the milk supply as a cause?

An answer upon the inclosed postal card will greatly oblige,

Yours very truly,

H. C. ERNEST, M.D.

Although in the replies received there was no scientific proof of the transmission of the disease in this way, it is the best in this line obtainable, and I would refer you to their bulletin, entitled "Infectiousness of Milk." In the replies, eight were that positive infection had taken place through the milk from mother to child; eleven from cow's milk to child; sixteen others were reported suspicious; negative disbelief, nine; simply negative, eight hundred and ninety-three; sixty-one others had paid no attention; fifteen were out of practice, and reported negative.

There seems to be a decided association of this exceedingly prevalent disease with the dairy cow. It would be impossible for me to give a more concise account of this than was given by Dr. Archibald, in his contribution to this Board a year ago, but on account of limited time, it was not read. He wrote as follows: "After several years of close study of this affection, and consulting all accessible statistics, and the habits of the people where the disease prevails, I have reached the conclusion that the only constant associated factor is found in the bovine species, without any regard to the social position of a community, its geographical habitation, terrestrial or atmospheric condition. There are

undoubtedly conditions of climate, habitations, etc., that favor the development of the disease, if the contagion be present; but this contagion, as I stated before, is most often derived primarily from the dairy cow. Therefore, if a community be closely associated with dairy cattle, tuberculosis prevails. In establishing proof of the position I have taken in this matter, I would like to give you the histories of a great many countries which, before the introduction of the dairy cow, experienced perfect immunity from this disease; but after the introduction of the milch cow into these countries, we have been told by men of undoubted authority, that the disease became prevalent. Owing, however, to my unwillingness to take up too much of your valuable time, I will, at the present, cite you only a few instances, at the same time assuring you of the fact that I could, if it were necessary, cite you a great number of cases to establish proof of the position I have taken in this matter. We will take, for instance, the country called the great Kabylia, in Africa, which is occupied by a semi-civilized race of people who, according to such eminent writers as Hersch, Evans, and other noted French authors, enjoyed an absolute immunity from consumption. According to Morrell, Dumas, and other historians, there is no evidence of the bovine tribe among them; but these people possess large flocks of sheep and goats, and each family has usually one buffalo ox to do its plowing. As these are a peculiar race of people, with peculiar ideas and habits, not calculated to encourage visits from Europeans, they retain their immunity from consumption to the present day. But not so with their neighbors, the Algerians. When this country was first occupied by the French, half a century ago, the natives were enjoying an absolute immunity from tuberculosis; but after the French imported dairy stock, in 1854, the statistics of the death-rate by Jackson, in his Medical Climatology, shows that consumption was the cause of a large percentage of deaths among the natives. And there are a great many other countries, furnishing reliable statistics of the death-rate from consumption, where the disease is not indigenous, but due to importation through the medium of dairy cattle; such countries, for instance, as Australia, China, Greece, Greenland, Central and Upper Egypt, Iceland, certain parts of Russia, the Hebrides, and others. Without going into further details respecting separate communities, let us consider for a moment the statistics of Europe, and there we find the prevalence of tuberculosis is regulated by the ratio of the bovine to the human race. Thus, in Ireland, where the cattle number 4,570,000, nearly an equal proportion to that of the inhabitants, according to Dr. Wilde, consumption is by far the most fatal affection to which the inhabitants of that country are subject. Denmark, with about the same ratio of cattle to inhabitants, sustains about the same ratio of consumption. In Portugal, where there are about six inhabitants to every one bovine animal, consumption attracts so little attention that few notes can be found relating to the disease in that country. In Italy, the distribution of cattle being one to six inhabitants, the mortality reaches an exceedingly low rate. Also, in Lower Egypt, where the ratio is one animal to about every thirty inhabitants, Pruner tells us that the disease is very rare. Thus the statistics go on, and when exceptions arise the cause is always evident in the conditions that influence the breeds of cattle. Taking into consideration all the foregoing facts, there can be little doubt that the inbred species of the bovine race is the prime etiological factor of consumption in the



human family. They not only nurse the germ, and prevent its extinction, but sow it in the human race continually and abundantly; and when we consider the comparatively few of the human race who are affected, and the immense number who are exposed to the infection and escape it, we are led to believe that without their aid the germ would die; for of all the germs known, none have so hard a struggle for existence in the human family as the tubercle bacillus. Man cannot generate new forms, but he can so control and interfere with nature's processes as to modify the original design. Inbred cattle are selected, sheltered, and pampered, as they would be unable to withstand the vigorous conditions of the wild state. They propagate earlier, are larger milkers and more efficient beef producers, and their meat is more delicate and tender than that of wild cattle. All of this is achieved by man at the expense of his own health."

#### INFECTION THROUGH THE CONSUMPTION OF TUBERCULOUS MEAT.

The danger from this source of infection is much less than from the use of tuberculous cow's milk, for the following reasons: Meat is usually consumed in a cooked condition, and thus is subjected, in the process of cooking, to a sufficiently high temperature to kill the disease germ if present, but in rare meat the temperature has not been raised high enough to destroy the germ, and it is therefore dangerous.

It must be remembered that in beef cattle the percentage of animals affected is much less than with milch cows. But where the disease is generalized, the germ has been found in the muscle, between the muscles, along the course of the large arteries, veins, and lymphatics. If people will take the pains to examine their beef roasts in these localities, especially those who use cheap meat (cow meats), they will have no need for a microscope to find caseous tubercles.

The sweet-bread of beeves is considered quite a luxury with some. These sweet-breads are nothing more nor less than pectoral lymphatic glands, situated anterior to the chest, and extending along the trachea. This is a common seat of the disease when found generalized, and in cooking this dish we would recommend that it be thoroughly done, or better still, like the writer, exclude this dish from your table.

The liver is also a common seat of the disease, and is often found on our tables. Large tubercles are easily detected in liver, and this dish is usually eaten well cooked, but I would also recommend that the use of liver be discarded.

A great many direct and positive instances of infection in this way might be related, but I will only record one here, coming under my own observation. Several years ago I was requested to visit a cattle range located on the reclaimed lands for which San Joaquin County is noted. Cattle had been dying from an unknown cause for some time, and later the swine had been dropping off, it was thought with a similar disease. Upon making a post-mortem examination of several of the most emaciated cattle, there was no doubt left in my mind that the disease was tuberculosis, and upon examining some of the dead swine, the same diagnosis was made; the latter had contracted the disease by feeding upon the tuberculous carcasses. Many of the pigs died from large abscesses in the throat, which is a common form of the disease in that animal. When the hogs were removed to another field, away from the dead cattle, deaths soon ceased among them.

## INFECTION FROM INHALATION OF DRIED SPUTUM, ETC.

This is considered, I believe, to be the most common source of infection from man to man. If this be a fact, and I do not doubt it, how great must the danger be from animal to man. Just reflect on the hundreds of tuberculous cattle that are constantly in our midst. At least 15 per cent of our dairy cows are affected, and possibly a larger per cent in this city, and say that 8 per cent of all cattle taken to your slaughter-houses, and they are discharging five times as many bacilli, each, as an ordinary phthisical person. Besides the discharges from the mouth and nose, there are the pharyngeal and submaxillary glands, and other external glands that frequently suppurate and discharge externally large quantities of tuberculous pus. When it is estimated that 50 per cent of infection in cattle occurs by inhalation of the bacilli, it would suggest the necessity of extreme care and cleanliness on the part of attendants of cowsheds and yards, lest they themselves contract the disease. The emanations from the ox are transported from place to place by the dairy-man, by the dairy-wagon, by the winds that sweep through the sheds and yards, and by the cattlemen and the butchers. The freight cars that have transported tuberculous cattle to your slaughter-houses are sidetracked and cleaned of their excrement, and again the wind does its part in distributing the contagion. Thus we might continue, indefinitely, to show the possible and probable sources of infection from cattle to man; but since the fact of the identity of this disease in all animals, always caused by the same bacillus, has been established, and as we show that the avenues for contagion are open on every hand, we are forced to give the bovine family credit for a large per cent of the cases of consumption in our own race.

Gentlemen, I thank you for your kind attention.

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THE ROLE OF THE VETERINARIAN IN HUMAN  
PROPHYLACTIC MEDICINE.

By DR. F. A. NEIF.

A couple of years ago, during a session of this convention, held in this city, I was requested to prepare a paper on a topic relating to the connection existing between human and veterinary medicine. In this paper I brought forth some forcible arguments in relation to the vital role of the comparative physician in regard to the public health. This field of relationship is so wide that it was an impossibility for me to do full justice to my task at that time, and I now take this opportunity to bring before this convention facts which, a few years ago, were entirely discarded, or, to be more accurate in my statement, forgotten. The University of California, having realized the importance of this branch of medical science, has lately added a veterinary department to its affiliated colleges. This much needed addition will, we hope, bring this medical branch to the standard to which it is justly entitled; and by its influence eradicate that pest which infests all professions, that class of individuals which pollutes a noble object and brings each hard learned science into disrepute among the non-educated public; I allude to the quack.

I have not the time, nor is it my purpose, to discriminate between the two kinds of individuals that may be classified under that heading; but let me say that I do not refer to self-educated men, who, not having had the advantages of a collegiate medical education, were, nevertheless, students, and diligent ones at that. I will only allude to that species which, with unscrupulous means and unbounded, ignorant cheek (the most dangerous element of all), enters into the good graces of the unsuspecting public and brings to bear influences which place them in position to injure and throw disregard on a profession which, on this side of the Rockies, is, as a rule, not appreciated by the laity and a portion of a certain medical public. A comment on this last paragraph is not to be considered in this paper, as I am not reading a dissertation on medical education.

I will now enter into the subject proper, *i. e.*, the role which the veterinarian plays in human prophylaxy. This role is, to the human family, of the utmost importance; and should this fact be realized by the politically appointed authorities, thousands of lives, in our State alone, could be saved yearly. It is not my intention to criticise the knowledge of the persons appointed to examine the different animal foodstuffs sold to and to be consumed by the people of the State of California, for the merest tyro in sanitary science has already realized the fact that under the present system of appointment a knowledge of veterinary pathology, hygiene, sanitary medicine, bacteriology, and kindred scientific branches is far from being necessary to be appointed to the position of public custodian of the lives of our wives and children, let alone of that of the breadwinner. But I contend that it is imperative that the State authorities appoint men having the requisite knowledge of food inspection, as well as of the different diseases communicable from animals to man, and of those which are contagious between animals. It is not my purpose to enter into a minute description of the numerous diseases originating from the domesticated animals, and from which humanity suffers. I will only cursorily mention a few that are most commonly met with in California.

The most dreaded of diseases emanating from animals, which a veterinarian is called upon to attend, is that which originates in the dog; namely, rabies. But fortunately this fatal malady has not, as yet, been found in this State, although reports have been made of a few cases. It was my good fortune to be called upon to hold post-mortem examinations on the bodies of four of these so-called rabid canines, and the results of the autopsies, as well as the experimental inoculations which followed the necroptic observations, were entirely negative. Therefore, we will not dwell on this particular disease.

Tuberculosis, a disease which originates in an animal the veterinary surgeon is called upon to attend—*i. e.*, the cow—is, as you are all aware, the permanent plague of the nineteenth century. Seeing the number of papers that have been prepared on this subject and advertised to be discussed during this convention, I will not, in order to save time, attempt to discuss, but will state that a proper corps of qualified veterinarians should be regularly appointed to inspect the dairies, slaughter-houses, and herds, and to test, by means of Koch's tuberculin, any suspected case or cases which may come under their notice, and upon an affirmative reaction, condemn and destroy the germ-bear-

ing animal, thereby preventing the use of the flesh, milk, and other contaminable mediums of infection.

Another disease which is found in the bovine, and which has in many instances created havoc in the human family, is anthrax in its two principal forms. Still another (actinomycosis) is very common in California. I have on different occasions seen herds afflicted with this infectious malady.

Now, what do the owners and the present health inspectors know about these pests? Nothing whatever. And who, may I ask, should be the proper person to inspect herds so afflicted? Again, I will answer, the qualified veterinarian.

Would it not be folly, to be mild in expression, to have a man who knows nothing but the butcher trade, for instance, inspect, on behalf of a Board of Health, a house where smallpox, diphtheria, or cholera reigns, in order to quarantine the exposed or infected human beings inhabiting the premises?

Still, if we study the modes of inspection, other than the principal ones, we will find that in many instances it is carried on in a proper and scientific manner. In order to illustrate this fact, allow me to call your attention to an event which occurred a little less than two years ago, and which was published in the daily papers: A wealthy lady residing in the western portion of this city, had asked a friend who went to Japan, to send her some rare species of lilies. The party readily complied, and soon the lady, who was very anxious to take possession of the botanical gems, was notified that the steamer carrying them had docked. She summoned her carriage, and immediately, on arrival at the dock, was allowed on board, a servant accompanying her to help to carry off the Japanese flowers. But, to the dismay of the lady, a gentleman who introduced himself as an "Inspector of Horticulture," stated to her that the lilies were infested with certain insects, which fact would prevent her taking the flowers off the ship. Therefore, the plant had to be returned to its native land. This instance goes to show, by comparison, the want of judicious legislation.

In the case above mentioned a most commendable action was taken to prevent the infection of a certain species of our flora; but the principal factors of human health and life—that is, animals and their products used as food articles—are abominably neglected, and the people are daily supplied with a portion of their subsistence, which they, knowing the quality of the same, would not feed to a favorite dog.

While attending to several animals located in the northern portion of our city, I have, especially latterly, often passed through the Chinese quarter, and on numerous occasions, for my own satisfaction, visited several Mongolian butcher-shops, and in these found a number of white people buying a dark, slimy, and acid meat called, by the dealer, beef. It is a burning shame to see these fleshy masses hanging in the shops, to be sold to the poorer families.

Besides the condemnable food and the animal diseases communicable to man already alluded to, other maladies of a fatal and loathsome nature emanating from the horse have on numerous occasions been observed in San Francisco and vicinity—I allude to glanders or farcy. The City and County Hospital has several cases on record. In Petaluma there are also records of several deaths occurring from this horrible disease. It is my opinion, based on sound proofs, that a great

many deaths from glanders yearly occur in our city, and the causes given are mistaken diagnoses. It is about time, Mr. President and gentlemen, that the proper authorities, as well as the people, should realize the importance of the role of the qualified veterinary surgeon in sanitation and prophylaxy, and I hope and feel that, with proper legislation, before many years San Francisco will in that line equal, if not surpass, the principal Eastern and European cities.

**Discussion of Paper Read by Dr. F. A. Neif.**

DR. SAMUEL O. L. POTTER: Seeing that nobody else wishes to talk, I might say that this is a matter that I have been interested in for many years. Some four years ago, in London, I made a special effort among the physicians of the Royal College of Surgeons and other prominent men to add information which would give me a knowledge of some standard work or treatise on this subject; that is to say, on the subject of the communicability of disease from animals to the human family. I found that no one was able to direct me to a book dealing with that subject, but everybody said, "Oh, go to the 'Vets'; they know all about that." Well, I went to them. I went to Professor McFadden, the President of the Royal College of Veterinary Surgeons of England, and I have a letter from him, now in my possession, in which he states that there is nothing on the subject in a systematic form; that there is something scattered here and there all through the books of his department and branch, but that he cannot refer me to anything in a systematic shape on this subject. Now, it is a matter of very grave importance, and it ought to form, in some shape, a part of the teaching in every one of our medical schools. A short time ago, down at Monterey, I was speaking with Mr. Shoenwald, of the Hotel Del Monte. He showed me a beautiful pheasant that he had there, and he said this pheasant was ill, and he wanted me to examine its throat, and we went together to see it. He said it would not eat; he thought there was something the matter with its throat, from the way it breathed. We went and opened the mouth of this beautiful bird, which any of you who have been there has seen. I think it came from Japan. We found a false membrane filling the throat. It was plainly a case of pheasant diphtheria. We came to the conclusion to treat it with carbolic acid on the end of a match, and the result was that the pheasant got over its trouble. But it brought the subject again to my mind, and occasionally I come across something else to show me that, with cats, and dogs, and chickens, and animals all around us, our children are liable to get diseased at any time, and we ought to have a great deal more information on this subject broadcast than there is. I am extremely glad to hear it brought out in this place, and hope that this will only be a commencement, and that in future years the subject may receive more attention than it has heretofore.

DR. C. A. RUGGLES: The suggestion that has been made by the gentleman in regard to animals contracting disease, and the communicability from animals to man, has brought to my mind one considerable point, and that is cats and dogs in families. I know of my own personal knowledge of diphtheria being carried by dogs, and I have very good reason to believe that it has been communicated from dogs to children. I know of a family that had a case of diphtheria. They had

a pet cat, and the cat was allowed to be in the room, and in a short time afterwards I am just as well satisfied that that cat had diphtheria as I am that the child had it, and that it contracted it from the child. It has been my object and my aim from the time that I have had anything to do with sanitary matters, especially with diphtheria, to kill every cat and dog on the premises where there is a case of diphtheria. That is the way I get rid of the cats.

DR. J. T. McLEAN (of Alameda): As to the communicability of disease from animals to the human race, of course there can be no question. The City of Alameda, where I live, has passed an ordinance, and is strictly enforcing that ordinance, that every cow owned in the City of Alameda, as well as every cow owned in any dairy that is supplying milk to Alameda, must be examined with reference to its condition and state of health, particularly in regard to tuberculosis. The city employs, and pays by the month, a veterinary surgeon to do that work; and regularly every year, once or twice, that surgeon examines every cow in the City of Alameda, and last year there were twelve of the cows belonging to individuals, and used for the supplying of milk to the homes of those families, destroyed, because they were proven, after proper tests, to have tuberculosis. Out of the dairies which supply our city, there were quite as many more cows killed, proven to have been diseased with tuberculosis. Now, in this way we eliminate the animals which are tainted with this disease and which supply us with milk. As a result, our city is so much better off by reason of being saved from this danger and certainty of disease; not only danger, but certainty. I am not aware that such a stringent sanitary rule exists in any other city or State. If it does I would like to know it. But we regard it as very important, and I mention it with a view to the fact that it may be known and that other communities may take example from us in this regard and be benefited, as we think we are, in this direction. We all know how extensive the use of milk is; how important it is to infant life, to young life, and how important it is to the invalid who may be in mature life; and by reason of this fact, how important becomes its character in regard to the saving of a community from the danger of tuberculosis, which would grow seriously and widespread if tuberculous cows were allowed to give milk and that milk fed to the community. Now, in regard to the unscrupulousness of people who are selling milk; it is astonishing to what extent they will allow their viciousness to go. It came to my knowledge several years ago, that a milkman, who was supplying us with milk, had a cow which was seriously afflicted with cancer, and that cow grew to be very seriously ill, of course, and it was only a question of time when the cow would die. He sold that milk to the people in our city until almost the time the cow was ready to die, and we were not aware of it, of course. But when the cow died he sold the carcass of that cow to a person who was making bologne sausage in Oakland, and the community there ate the meat of that cow; showing a most reprehensible proceeding on the part of that man. He ought to have been sent to the City Prison for doing it. But that is what people will do, and there is a necessity for such stringent rules as we have adopted in our town in the matter of milk.

DR. REGENSBURGER: While on the subject of this paper, I think it is a question that should be thoroughly discussed this evening. It is one of the most important questions that has been brought before this meet-

ing. It is more important than the discussion brought up this afternoon regarding the importation of tuberculosis into this State, because we have it right here, and we are taking it into our systems right along. I will make this matter brief, and will simply bring up the question of milk, for the purpose of offering a resolution to go before the State Legislature—of course it would have to be formulated in the legal way—that each and every individual, community, town, or city should be compelled to employ an inspector to inspect the milk that is sold in that vicinity, wherever it may be; and, if you will allow me, I will write out a resolution to that effect. I think it is an important matter, and I should like to hear the ideas of some of the gentlemen on that question.

DR. McLEAN: The very suggestion made by Dr. Regensburger we also act upon. Our inspector is authorized by our ordinance to stop any milkman in the street and take a sample of his milk from his wagon, and he does it; and the contents of that sample are carefully scrutinized by him in his scientific processes, and if it does not come up to the standard of fats and milk solids, his milk is condemned. I ought to have said this much before.

DR. REGENSBURGER: The same thing has been done in this city, and the reason why I bring this matter up to make it a State law is for the very reason that we had as good a proposition before the Board of Supervisors of this city, recommended by the Board of Health. The following recommendation was made: That the different health inspectors of the city, if they should happen to meet a dairy wagon, should take a sample from his milk wagon. This bottle of milk should be sent to the Health Officer, marked Exhibit A, B, C, D, etc., and given to the Health Officer, with the name of the dairy. It was then turned over to the bacteriologist or chemist, simply as Exhibit A, B, C, or D. The result of the examination should be made known at an open meeting of the Board of Health. In case the result showed poor milk, this man would be published all over the city, and the newspapers would take hold of it and announce that that man's milk was tuberculous, or contaminated. We tried our best in every way. The matter was brought up. I went before the Supervisors as one of the members of the Board of Health, and there were about fifty milkmen who had one cow apiece, and probably the milk of that one cow was diluted three or four times to make as much as possible. They clubbed together, and the result was the whole matter was laid on the table, and we had no milk law. And for that reason I say there should be a universal law in the State, which should regulate this matter and prevent, not only the sale of this milk, but prevent collusion between the dairyman and the man who examines the milk.

DR. J. R. LAINE: Animals may have other diseases as well as tuberculosis. We all know that ring-worms are very frequently conveyed from animals, such as the dog or cat, to children, and from children to those animals. The fact that diphtheria is conveyed in that way is unquestionable. There are very few men in active practice who have had much experience with that disease, but what have noted instances of that character. That tuberculosis may be conveyed in that way is almost proven. That tape-worm may be obtained from dogs no one will dispute. So there are a variety of diseases that may be conveyed in that way.

DR. M. REGENSBURGER: I think the best way to do is to refer this whole matter to the State Board of Health, and let it come as a suggestion from this convention that the State Board of Health take this matter in hand and formulate a law which they will present to the State Legislature.

DR. J. R. LAINE: In December there was, at Washington, a national conference of State Boards of Health. Dr. Ruggles and myself were the delegates from this State. That question arose and was very ably discussed by gentlemen from different States, some advocating the killing of the animals, and that the State should pay for the animals, at various stages of the progress of the disease, they having a commercial value for which the owner of the animal was to be indemnified by the State. We, as delegates from this State, took the ground that when an animal was discovered to be affected with tuberculosis it had no commercial value at all; that the animal should be killed and should be a dead loss to the owner. I believe that to be right. The only practical solution that I listened to with reference to the entire matter of dairy and milk inspection was by a gentleman from St. Louis, Mo., who stated that his municipality proposed to issue licenses to the different dairies that supplied milk to the city. They would reserve the right to inspect the dairies, not necessarily the milk, because he claimed that in an inspection of the lacteal fluid the only thing that you would probably find would be an excess of water, and that need not necessarily imply that the milk was impure; but that when the milk was obtained from cows afflicted with tuberculosis, there was positive danger, even though under the microscope it showed nothing. Therefore, they reserved the right to inspect the animals and to discriminate and decide that when an animal was found to be in a diseased condition it should be removed and put out of the way, or they would revoke the license for bringing milk to the city. That seems to be the only practical solution of the difficulty; that a municipality had a right to impose such regulations as were necessary to protect itself, regardless of the general law. A law was passed at the last session of the Legislature, such as Dr. Regensburger suggests, and is now in effect, nevertheless it remains for the municipalities to regulate their own affairs and insist on them.

DR. M. REGENSBURGER: That don't prevent us. There is only one way to achieve anything, and that is to keep on kicking, and I am one of that kind, and that is the only way you will get anything, and therefore I wish to bring this matter to an issue, to get a simple recommend to the State Board of Health that they urge this matter again before the next Legislature, and if I can aid them and help them I will do so. I move that the State Board of Health be requested to formulate a bill covering the grounds discussed this evening on this paper, and bring it to the attention of the next Legislature.

(Motion seconded.)

DR. C. A. RUGGLES: Upon that subject you must consider, first, that two years of valuable time is going to be wasted, if you leave it to the State Board of Health to formulate a bill. The Legislature meets only once in two years. It has only just adjourned. Now, to wait two years before anything is to be done to protect the community from poisoning by tuberculous milk, looks to me very foolish. The State Board of Health has only advisory powers. It can advise, and is ready to advise, and does advise the local Boards of Health to enforce this



matter as against tuberculous animals. I believe every city government and every municipal government in this State has the right to frame such ordinances and laws as are self-protective. The State Board of Health will advise you to do it. It is your privilege, and your right, and your duty to do it. I do not believe in putting it off two years; I am in favor of immediate action. As a member of the State Board of Health I will say that the State Board of Health is with you in this business, thoroughly and unanimously, and I hope that this subject will be thoroughly discussed, and that every member of this convention will have an opportunity to express, through himself or somebody else, his opinion on this matter. It is a very important question, and it is one that I hope will be thoroughly discussed, and that we will arrive at some conclusion, so that when we go home, each to our little old town, we will know just what to advise people to do. Only a few days ago a gentleman who is largely engaged in the selling of milk in my town, came to me on that proposition. He said, "Doctor, ought not the Board of Health to enforce the purity of the milk supply?" I said, "Yes." Then he said, "I, as a man engaged in the sale of milk, am in favor of it. I believe that every person who sells milk in this city should have a certificate, from a proper examining person, that his cows are free from tuberculosis. Other matters, as the cancer and such things, will take care of themselves. It is tuberculosis that I am after." I told this man, "The Sanitary Convention of the State of California will meet next week, and this matter will be thoroughly discussed, and when I come back home I will tell you just what to do, and as Health Officer of the City of Stockton I will vow to you there will be something done."

DR. M. REGENSBURGER: It is all very well for the Health Officer of the City of Stockton to talk, but when it comes to San Francisco it is a different question, for the reason that the milk supply of San Francisco is from the surrounding counties. Very little milk comes from San Francisco itself. We have milk from Marin, Contra Costa, and San Mateo Counties, and how in the world are we to make an inspection of the dairies and the cows, unless it is a State law? It certainly should be a State law, and that is the only way to get around it. The community of San Francisco, which gets its supply from so many different places, cannot inspect it. We have no right to inspect the cows in San Mateo and Marin Counties; it is none of our business. If we had a State law, which would make it a misdemeanor for any man to sell milk from a tuberculous or a diseased cow, or have in his possession a diseased cow, matters would be remedied very much quicker than they will be in any other way, even if it does take two years; we are very slow in this country, but when we make up our minds to go ahead, we go ahead. I am sorry to say it is two years until the Legislature meets, but that makes no difference. The State Board of Health is here for that purpose. They are not only advisory, but they should recommend to the Legislature what sanitary laws to pass. They are the body to do it, and nobody else.

DR. GEO. W. DAVIS: I am quite in harmony with the suggestion of Dr. Regensburger and also of Dr. Ruggles. They anticipated my idea about premature action. It is two years before the Legislature again convenes, and we perhaps will have two meetings of the State Sanitary Convention before that time; doubtless will; and it seems to me that we would

be better prepared, or Dr. Regensburger would, at the end of that time, to formulate some plan. We will have grown in knowledge before that, and I think it would be perhaps well to wait until the second meeting from now, because the Board cannot do anything now as far as legislation is concerned. What power they have they can exercise now. It seems to me that we are jumping ahead of time. If we wait a year or two longer we will be more competent to formulate the bill.

DR. C. A. RUGGLES: A law was introduced into the Legislature, and it went along a considerable distance, and the Governor asked me what I thought a tuberculous cow was worth, and when I expressed the sentiment of the National Board of Health that a tuberculous cow was not worth anything, said he, "That is what I think."

DR. M. REGENSBURGER: Then it simmers right down to the value of a cow and the value of a human being. Now, which is worth more, the cow or the human being? That is what we are here for. We are here not to take into consideration the value of a cow, but to take into consideration the value of human life.

PROF. A. A. CUNNINGHAM: I have had considerable experience in the examination of milk. During the last five years I think I analyzed, and sometimes microscopically, about two thousand samples of milk. The discussion regarding the inspectors of milk reminds me of a little incident that occurred about three years ago, which I think the present Board of Health of San Francisco should follow. I may be mistaken, but I think they had several milk inspectors; probably one; I don't know whether several or one.

DR. M. REGENSBURGER: They never had any at all.

PROFESSOR CUNNINGHAM: Well, I was engaged by one of the members of the San Francisco Board of Health to make some investigation of the milk question. He said he would supply me with some samples, and I said I would supply myself with others, getting them both from the dairies and from wagons on the street. I received, I think, about forty or fifty samples through this particular member of the Board of Health, and one day when I had examined about twenty-five, five samples were handed to me by a boy. I took them. They were by numbers. I couldn't tell anything about the dairies, but I noticed the peculiar condition of the milk in two bottles. The milk was coagulated, and upon removing the cork I found the bottles had been used for holding carbolic acid, and had not been cleaned. I didn't say anything, but before I had completed the examination of the remainder of the samples of milk I had received through this so-called inspector—because he deemed himself such, and called at my laboratory and showed me his star—out of the balance of twenty odd samples of milk which I received, there were twelve which were in an unfit condition for a chemical analysis. Why? Because the man who took those samples from the dairy wagons did not know the first principles of science regarding cleanliness. He had used dirty bottles. If our Board of Health of San Francisco cannot instruct the authorities, or the persons who have the authority to take these samples, in the method of cleaning bottles, then we had better do without milk inspectors, so far as the ordinary inspector goes. Milk inspectors are very good things when they know their business. I believe in them, but I do not believe in a milk inspector having the authority to take a sample of milk from a wagon, put his hydrometer into it, and declare that the milk is no good, because its specific gravity happens to

go below a certain figure. Therefore, if we are going to have inspectors of milk, I think a very good thing would be for the Board of Health of San Francisco to confer with the Veterinary Department of the University of California. The Veterinary Department of the University is a baby institution. It, however, has several persons upon its Faculty who are noted, not only on the Pacific Coast, but on the Atlantic and over in Europe, and if the present Board of Health would confer with the Faculty of the Veterinary Department of the University, or invite the Faculty to confer with them, we would only be too glad to assist the Board of Health in every possible way in examining the cows, examining the milk, chemically and bacteriologically, and giving our report.

DR. M. REGENSBURGER: I am very glad for the recommendation that Professor Cunningham has made to the Board of Health, but I am not very much pleased to hear a man make assertions that are not true. I would like to ask whether Professor Cunningham was ever paid by the Board of Health for those examinations.

PROFESSOR CUNNINGHAM: I said I received the work privately. Dr. Creeley was the man who came to me.

DR. REGENSBURGER: What right have you to assert that the Board of Health sent you those bottles?

PROFESSOR CUNNINGHAM: A member of the Board of Health did.

DR. REGENSBURGER: You said the Board of Health. I don't like to take up a fight for the Board of Health, but I do hate to see a man rise and make such statements here. Here is a man making statements not true, and I, as one of the members of the Board of Health, won't stand it. If one of the doctors found it convenient, or in his pleasure, to send him milk, that has nothing to do with the Board of Health. I am a member of the Board of Health and had nothing to do with it. He was not paid by the Board of Health, nor authorized by the Board of Health, to make any examination of that kind. And another thing: I think if the Board of Health wanted a milk examination made from a medical standpoint, that a chemical analysis would be a secondary consideration, and I want Professor Cunningham, when he makes an assertion of that kind, to make proof of the assertion.

PROFESSOR CUNNINGHAM: I would like to submit proofs.

DR. J. R. LAINE: I would like to repeat what I said. The City of St. Louis is in identically the same position that the City of San Francisco is, and I do not apprehend that its dairies are maintained within its corporate limits any more than dairies are maintained within the corporate limits of this city. They may extend across the river, in the State of Illinois, or perhaps over the county line. Nevertheless, that municipality makes this condition: "We will grant you a license to bring your milk into this city, but you must maintain your herds and your dairy in such condition as to meet our approval, otherwise we will revoke your license." That is all there is to it.

MRS. HELEN MOORE: I do not see how it is that Alameda can have such excellent sanitary regulations and that over here in San Francisco we cannot have them. I think the mistake lies in American cities looking always to legislatures to do something that they might do themselves. I think this whole matter of milk inspection and market inspection should be attended to right here in the City of San Francisco, and certainly our Board of Health and Mayor should be responsible for it in

some way or other. I should like to ask Dr. Neif, through you, Mr. Chairman, whether the Market Inspector of San Francisco is a veterinarian; if he knows whether he is or not.

DR. NEIF: I would state that I know absolutely nothing as to the qualifications of those gentlemen.

MRS. HELEN MOORE: Those gentlemen are appointed by our Board of Health. Then I ask you, who is responsible for this? Now, we know very well that it is a custom among dairymen here—of course it is to their interest—as soon as they find a cow that is tuberculous, to remove it from their herds. Self-interest will prompt that, but they will tell you frankly that while they do that, at the same time they do not lose anything on that cow, because they sell it for the purpose of making bologne sausages, as has been stated here by Dr. McLean. If we cannot depend upon our Boards of Health to protect us and to carry out sanitary measures, what is the use of appointing them? What is the use of having them at all?

DR. J. R. LAINE: Boards of Health are advisory merely in their functions, and are not invested, as a rule, with any authority further than that, unless it is specially conferred upon them through legislative enactment, and these Boards of Health are given powers to do so much, to advise so much, and other Boards—that is, Trustees or Supervisors—if they choose, approve, and give these recommendations the authority of law, and have them enforced. Otherwise they have no power at all. The enforcement of the laws is not a part of their duty.

MRS. HELEN MOORE: When this thing can be done in Alameda, why can it not be done in San Francisco?

DR. M. REGENSBURGER: The probabilities are the Board of Supervisors in Alameda are more intelligent than the Board of Supervisors of San Francisco.

THE CHAIRMAN: Are you ready to vote on this motion of Dr. Regensburger? The motion was that the State Board of Health be requested to formulate a law and present it to the next Legislature, and recommend its passage by the next Legislature, covering the grounds that have been discussed here this evening?

DR. C. A. RUGGLES: I move that the resolution lie on the table until the next meeting of the Sanitary Convention.

DR. BERT ELLIS: I move, as an amendment, that the Board of Health report to the next convention.

THE CHAIRMAN: I will declare that amendment to an amendment out of order.

DR. M. REGENSBURGER: It is a very important question, and I hope it will be carried. I think the amendment to an amendment would be the proper thing; that is, that they formulate a law which they present for approval at the next meeting of the convention.

THE CHAIRMAN: I do not understand that Dr. Ruggles' motion is in the shape of an amendment. He moves to lay this subject upon the table until the next meeting.

DR. C. A. RUGGLES: I did not offer it as an amendment, but as another motion.

DR. BERT ELLIS: I move, as an amendment to the original motion, that the Board of Health be instructed to formulate a law and present it to the next Sanitary Convention.

THE CHAIRMAN: You will first vote on Dr. Ruggles' motion to lay this subject-matter on the table.

(Dr. Ruggles' motion was lost.)

DR. M. REGENSBURGER: I accept the amendment of Dr. Ellis, as an original amendment.

DR. J. T. McLEAN (of Alameda): If it is allowable to make an amendment to an amendment, I would like to do so. I would like to bring before the convention, that in the meantime, between now and the next State Convention, it is the duty of the State Board of Health to advise the different communities of the State in regard to this matter of home sanitation in connection with milk; send them circulars which shall enlighten them as to the course they should pursue, so as to save their respective communities from the dangers that come to those communities from disease brought by diseased animals.

DR. M. REGENSBURGER: That is a different motion altogether. That comes as a separate motion. That has nothing to do with this amendment. It is not an amendment to an amendment. It is a good motion. I am willing to second it when it comes up in the proper form.

DR. J. T. McLEAN: I am not tenacious about it, so long as it comes up.

THE CHAIRMAN: The vote will be taken on this motion as amended, because the amendment has been accepted by the original mover of the motion, so that it is incorporated in the original motion. You understand that as well as the Chair can state it to you; that is, that the State Board of Health formulate a law, to be presented to the next Legislature, and that they recommend its passage, covering this point about milk inspectors, and that they report the law thus formulated to the next Sanitary Convention.

(Motion carried.)

F. A. NEIF: I have heard a good deal of discussion to-night, not on the subject proper, but simply on small details. Other papers have been read and discussed already on the subject of tuberculosis, but we should all go to the source of the evil; that is, the dairy inspection. To relate one instance: A couple of years ago I was in Paris, and the Government Farm sent for eighty-five Flemish cows; magnificent looking animals. One of them became sick. The veterinary inspector did not make a diagnosis of the case, and Professor Alvord was sent for, and he tried tuberculine and had reaction. The cows were in good condition, every one of them; they were fat and well, with the exception of the one that had shown symptoms of disease. They inoculated every one. I think it is a source of evil that we should stop, and not look to the result. It is inspection of the animal, and food supplies generally; not milk alone.

DR. E. N. ROWELL: I would be obliged if you would recall the motion of Dr. McLean. I think it was probably not heard. It was that the State Board of Health be requested to communicate with local boards of sanitary districts, advising them upon the question of protection against disease from milk.

(Motion seconded and carried.)

## DAIRY AND MILK INSPECTION.

By E. W. CHARLES, M.D., Health Officer, Palo Alto, Cal.

In the whole realm of medical literature, there is not a single subject more worthy of scientific study and research than the prevention of disease; and in no single line of study is there an opportunity for such grand achievements as in the subject I shall present to this convention.

The medical, scientific, and even daily journals have for years had pages devoted to the discussion of bacilli, their cause, effect, and the thing that will kill them without killing the patient who is infested with this minute but much-dreaded enemy of humanity. Koch has given us his antidote for the tuberculosis bacilli, and now comes anti-toxine. The sure death to bacillæ diphthericæ, a god-send to the world, if it only accomplishes one tenth as much as it is credited with, should be welcomed and carefully tested by the medical profession; indeed, is being scientifically proved, both in America and on the Continent, to be the treatment for that horrible scourge diphtheria, which has swept its thousands of victims from earth.

While these are important discoveries and worthy of all the research and study given them, and their discoverers will truly merit the world's applause, they are not of more importance than the inspection of dairies and milk. The discovery of anti-toxine may save thousands of lives, but the critical and scientific inspection of dairies, milk, and cows, their quarters and feed, under proper legislative authority, will save millions.

In discussing this problem, the limited time allowed me will, perforce, confine me to statements which I believe to be, on the whole, correct, without quoting statistics or authorities to sustain my position.

The adage, "An ounce of prevention is worth a pound of cure," is particularly applicable, as in the fullest sense this inspection is for the prevention of disease, and not only one, but many, and of so severe a type that once they have attached their tentacles to man, woman, or child, they never let go their hold until their victim lies cold and pulseless in the arms of death. This is made apparent when we remember that cows are not only infected with tuberculosis, anthrax, diphtheria, and cancer, but many other infectious diseases, any of which may be scattered broadcast by the consumption, not only of milk, but of butter and cheese. The question then arises, are the milch cows of this coast or the United States infected with any disease to a sufficient extent to call for such legislative action as will force the owners of cows and dairies to have only healthy cows, properly housed and fed? A careful review of much literature on this subject leads me to conclude that at least one third of the milch cows of this coast are infected, and that for the whole of the United States 50 per cent are diseased; of the diseased, about one half have tuberculosis, one fourth cancer, one eighth anthrax, the other eighth of the 50 per cent have diphtheria and other infectious diseases.

If such be the case, and I believe I am nearly correct, what a source of infection we have in this vast array of diseased cows scattering broadcast the germs of terrible, and in many cases, incurable diseases. The daily consumption of milk in the United States is not far from 15,000,000 gallons per day; of butter, about 4,000,000 pounds per day,

besides a large quantity of cheese. Unless this milk be healthy, what a source of disease, for it is an admitted fact that butter manufactured from diseased milk may transmit such disease if it be infectious, and I claim with many others that cheese is in nowise exempt, as the process of manufacture does not necessarily, indeed, more than probably does not, interfere with the life or activity of tuberculosis bacilli or of any others that may infest the milk. In this large consumption of the various products of the dairy we have the cause of many diseases, and one source of the constant increase of tuberculosis and cancer.

That milk is at least a pronounced source of tuberculosis is fairly demonstrated when we call to mind the fact that nations are affected by tuberculosis just in proportion to their consumption of milk and its products, especially milk; the nations that consume the most milk suffer most from tuberculous diseases, therefore we must necessarily conclude that if milk from a tuberculous cow will transmit tuberculosis, if the cow has cancer, anthrax, or other infectious disease, it will also transmit it.

If my conclusions are correct, how imperatively necessary it is that something be done to prevent the scattering of the seeds of suffering and death by the use of diseased milk and its products. What is the remedy? One would say, sterilize your milk. If it could be generally and successfully practiced it would not be the best method, but any one who has given any thought to this subject knows this is impracticable. We must strike at the root of the evil, and the only way to do this is to have such laws made as will wipe out of existence every diseased bovine in America, and by a careful inspection of all herds of cattle at least once a month. This inspection must not be physical only, but tuberculine must be used freely, as by this method alone can we surely discover even the latent germs of tuberculosis; as to other diseases, we must confine our inspection to physical examination.

There should be established a National Board of Health, with a cabinet officer, and laws relative to this question similar to the laws in New York or Michigan. If we cannot have national control of this matter we must have similar laws in this State and intelligent inspectors appointed, not inspectors appointed by a political boss because of his services, but appointed for their intelligence; experts in examination of milk, knowing how to use tuberculine, and understanding its effects; men who know all the diseases with which cattle are infected; men who know their duty and will do it. A sufficient number of inspectors should be appointed so that every herd of cattle, every dairy and cow, could be inspected at least once a month, until all signs of disease of at least an infectious character are stamped out. These inspectors should be appointed and under the control of the National or State Board of Health, and paid by the State in which they live.

But you may say this will cost a great deal. So it will, but is money to be considered when health or even life is at stake? Let it cost money, so that we save the thousands who are dying every year from diseased meat and milk and its products. Have such an inspection made and kill all infected cattle, whether milch cows or beef cattle, and follow it up, and in six years you will reduce the cases of tuberculosis one half, besides totally annihilating many other diseases, as this inspection is not aimed alone at tuberculosis, but at all diseases of an infectious character with which cattle are liable to be infected.

I have but merely skimmed over the surface of this seething caldron of disease and death. I have not time to discuss the minute details of pathology and therapeutics.

Gentlemen, if you desire this dirty pool purified, which is menacing the health and life of our State, and by its contaminating influences scattering disease and death, you must put your shoulders to the wheel and never give up the struggle until by National or State legislative action we have such laws as will place this sore evil in the hands of Boards of Health, with the power to purify this infectious pool; then something will be done.

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### INFECTIOUS DISEASES OF THE EYE.

By W. F. SOUTHARD, A.M., M.D., of San Francisco, California.

Whenever a strike takes place, either on a railroad line, in machine shops, in mills, in factories, in fact, wherever any considerable number of persons are employed, there is always a greater or less disturbance to our social system. The measure of this disturbance we are accustomed to estimate in dollars and cents. There is a loss to the employed of their wages, while the employer, though saving these wages, may suffer a far heavier loss in his inability to fulfill his engagements. The stoppage of a railroad system, mills, or factories, not only creates confusion in business, but together with the cost of putting down the strike, may cause a loss to the town, city, State, or even the whole country, which can scarcely be measured in money values.

The same lines of reasoning may be applied to the losses which may follow the *involuntary* withdrawal of wage-earners from work by reason of sickness. Though this form of loss is free from the direct observation of the general public, by reason of the lack of confusion and turmoil which accompanies a strike, it is none the less going on, though in a silent and insidious manner. In the aggregate this loss every year must be as great, considered from a money standard, as that due to a general strike. It is difficult at first thought to realize that the mere taking away of a single unit of effective energy from work could be serious enough to cause remark. Yet when we come to look at the matter a little more closely it will be at once seen that absence of that unit may mean considerable. For example, a laborer or mechanic, the provider possibly for a large family, is suddenly stricken with sickness. His wages, though small, have been sufficient to fairly comfortably house, clothe, and feed his family. With loss of daily wages all is changed; the situation becomes serious and somewhat complicated. The first disturbance is occasioned from the necessity that his place be supplied by another. Ceasing to earn wages, other disturbing factors enter, viz.: medical attendance, medicine, food, and shelter for the family must be provided. Outside assistance must be invoked; it may be neighbors and friends or some charitable organization intervenes to prevent the family from being thrown upon the street by a heartless landlord, and the father taken to the county hospital. It would seem that nothing can be clearer than that the taking of but a single unit from its proper position produces disturbance which must be felt beyond its immediate self. The breaking down of one of our complicated pieces of modern



the first few days after birth), it may develop in from a few hours to three days. When the disease has gained a strong foothold no remedies will arrest it; it must take its course, when loss of one or both eyes or serious injury is sure to result. As a result of this discovery of its bacterian origin, Credé, in 1880, devised his method of *preventing* the disease, rather than to find a *cure*.\* He carried out the rule of absolute cleanliness of the child when first born, then dropping into the eyes a 2 per cent solution of argentic nitrosi (nitrate of silver). The result was remarkable. The disease which at one time was almost sure to end in blindness, was now, by Credé, put in the category of diseases which have no excuse for existing. Immediately the number of cases occurring in the maternity hospital fell to less than 1 per cent, and no cases of blindness. Wherever this method has been used the same results follow. The disease itself is now almost unheard of in hospitals. It is, however, very prevalent in the poorer quarters of all our large cities. This is in part due to the fact that so few women among the poorer classes employ physicians to attend them in confinement; as a rule, they either have none, or only some ignorant midwife, who knows absolutely nothing of the duties of her position.

In the United States, in 1880, when the statistics of the census relating to blindness were compared with those of 1870, it was found that there had been an alarming increase. There was found in the entire United States an increase of 111.03 per cent; and in New York State an increase of 125.07 per cent. "In the State institutions of blind at Batavia it was found that 23 per cent of the inmates were there because of ophthalmia neonatorum." "Taking the blind children found in all asylums, 16 to 22 per cent are there simply and solely because of this disease." (Howe.) Having discovered the cause of this disease and its prophylaxis, it would seem that nothing could be plainer than to immediately act upon this knowledge and thus wipe it out. Those who have investigated the matter believe that there is but one method to pursue, viz.: That a law should be made governing the care of children the first few days subsequent to birth. Acting upon that idea, the State Medical Society of New York in 1889 appointed a committee to investigate this subject. A law was at once unanimously passed intending to govern midwives, nurses, or any person having in charge new-born children. Having

\**Vide* Pacific Medical and Surgical Journal, Vol. XXVIII, pp. 359-363, and pp. 423-427; a translation by C. H. Rosenthal, M.D., of a paper on "Ophthalmia Neonatorum," by Dr. R. Labusquiere, in which the author shows that this disease is of bacterian origin. The treatment as carried out by Credé is given in full with results. These results are so conclusive as to the value of antiseptic treatment, that they will bear repeating, and are here given:

Year.	Number of Births.	Number of Ophthalmia Neonatorum.	Per Cent.
1874	323	45	13.6
1875	287	37	12.9
1876	367	29	9.1
1877	360	30	8.3
1878	353	36	9.8
1879	389	35	9.2
1880 (to May 31)	187	14	7.6
*1880 (balance)	211	0	0.0
1881	400	0	0.0
1882	418	1-2	0.25 to 0.49
1883 (3 months)	131	0	0.0
March, 1883 to March, 1884 } about	400	0	0.0

\* Installation of 2 per cent solution argentic nitrosi began June 1, 1880.

been found to be inoperative through verbal inaccuracies, it was repealed in 1891 and a second Act passed, also unanimously, immediately thereafter. This law stood the test of the courts. Several convictions were obtained under it, the first one by Dr. Noyes of New York. "These convictions are sufficient to show that the law can be easily enforced, and that even one such case is sufficient to impress upon midwives and nurses what never could be taught by any amount of lecturing or exhortation." (Howe.) A similar law was passed in the same year in Maine; Rhode Island, 1892; Minnesota, 1893; Ohio, 1894, and Maryland, 1894. In several other States a law has been already reported upon favorably this last winter. In many other States a law has been introduced. It is hoped and believed that in every one of these States a similar law will be enacted this session. No opposition has been developed in a single instance, excepting here in California. It is very difficult to understand how there could be any just opposition. It is so manifestly in the interest of public health that it should commend itself to every person who looks into the subject.

Parents have but to recollect this fact, that their children, during the first days after birth, are practically at the mercy of the nurse. It startles one when he comes to realize how much may be at stake when an ignorant nurse is in command. It would appear from these facts that this matter ought to properly come under the head of preventive medicine and sanitation. For the same reason that you appeal to the taxpayer to vote for needed improvements in streets and drainage, viz.: that it is for his interest, so we ought to find in the same class of persons a readiness to pay taxes for the prevention of disease. This economic view must not be lost sight of. In these days of reckless extravagance in the expenditure of the people's money, the taxpayer, I am sure, will eagerly accept any proposition which will save his pocket.

An attempt was made last winter, in this State, to pass a law to govern midwives and nurses, but through some error in its management the proposed law was strangled in committee; the members grew funny over the so-called "red-eyed bill." Had one of our wise solons a child blind from this disease, he would not have been so jocular; on the contrary, he would have been an earnest champion for justice for our hapless population. A proper understanding of the import of the law could not have been realized by these men, else they would have at once seen the justice of the law and have passed it. There would have been no cost to the State, no class legislation, nothing except for the good of the community. "The physician can, by means of suitable antiseptics, fight micro-organisms, arrest their development, destroy them, and consequently cure the disease they cause." (Howe.) This is true, but if we can go further and say that the disease need not exist, we shall be far ahead of those whose only aim is to give medicine to cure the disease.

Of the remaining infectious diseases of the eye, it is only necessary to say that since they are due to micro-organisms, they can easily be controlled and stamped out in their early stages by the use of proper precautions. Unlike ophthalmia neonatorum, they cannot, under our present social system, be brought under legislation. It is, however, proper to say that the State can and ought to provide leaflets on all infectious diseases, authorized by the State Board of Health. The subject of house disinfection, methods for keeping sick-rooms purified,

simple remedies to be used before the doctor is called, etc., legitimately belong to the subject of State sanitation.

We are indebted to Dr. Lucien Howe, more perhaps than to any other single person, for the persistent following up of the subject for prevention of blindness by legislation. The proposed legislation which has met with the greatest approval is as follows:

SECTION 1. Should one or both eyes of an infant become reddened or inflamed at any time within two weeks after birth, it shall be the duty of the midwife, nurse, or person having charge of said infant to report the condition of the eyes at once to some legally qualified practitioner of medicine of the city, town, or district in which the parents of the infant reside.

SEC. 2. Any failure to comply with the provisions of this Act shall be punishable by a fine not to exceed one hundred dollars, or imprisonment not to exceed six months, or both.

The appended table, prepared by Dr. Howe, shows what is being done in those States which have not as yet passed any law to regulate midwives and nurses. The individual must not be permitted to carry around and distribute the seeds of infection. This is not an interference with individual rights, but a restraining of the unit for the good of the many:

## THE PRESENT CONDITION OF LEGISLATION FOR THE PREVENTION OF BLINDNESS.

State.	Will Coöperate.	Resolutions Favoring Legislation Adopted.	Committee Appointed.
Alabama .....	Dr. B. J. Baldwin, Montgomery. Dr. S. L. Ledbetter, Birmingham. Dr. W. H. Sanders, Mobile. Dr. Y. G. Woodson, Birmingham.		
Arizona .....			
Arkansas .....	Dr. H. Moulton, Fort Smith. Dr. J. W. Scales, Pine Bluff. Dr. George W. Smith, Fort Smith. Dr. C. S. Gray, Little Rock.		
California .....	Dr. W. D. Babcock, Los Angeles. Dr. A. Barkan, San Francisco. Dr. H. Bert Ellis, Los Angeles. Dr. George H. Powers, San Francisco. Dr. W. F. Southard, San Francisco.	San Francisco Society of Eye, Ear, and Throat Surgeons. State Medical Society. San Francisco Medical Society. S. F. Medico-Chirurgical Society.	San Francisco Society of Eye, Ear, and Throat Surgeons.
Colorado .....	Dr. John Chase, Denver. Dr. F. D. Green, Pueblo. Dr. E. C. Rivera, Denver. Dr. J. R. Robinson, Colorado Springs. Dr. C. E. Walker, Denver.		
Connecticut .....	Dr. W. Y. Eacon, Hartford. Dr. H. W. King, New Haven. Dr. S. B. St. John, Hartford.		
Delaware .....			

## THE PRESENT CONDITION OF LEGISLATION FOR THE PREVENTION OF BLINDNESS—Continued.

State.	Will Coöperate.	Resolutions Favoring Legislation Adopted.	Committee Appointed.
Florida .....			
Georgia .....	Dr. A. W. Calhoun, Atlanta. Dr. R. O. Cotter, Barnesville. Dr. James M. Hull, Atlanta. Dr. C. H. Peeta, Macon.		
Idaho .....			
Illinois .....	Dr. Boerne Bettman, Chicago. Dr. W. F. Coleman, Chicago. Dr. Henry Gradle, Chicago. Dr. C. D. Westcott, Chicago.	At State Medical Society, held April 15, 1894.	Dr. B. Holmes, Chicago. Dr. E. J. Doering, Chicago. Dr. Boerne Bettman, Chicago, Chairman.
Indiana .....	Dr. A. Blitz, Indianapolis. Dr. George H. Keiper, La Fayette. Dr. I. P. Morrell, Terre Haute. Dr. J. L. Thompson, Indianapolis.		Dr. George H. Keiper, La Fayette. Dr. J. L. Thompson, Indianapolis. Dr. A. Blitz, Indianapolis. Dr. F. C. Heath, Indianapolis. Dr. A. F. Schaffer, South Bend.
Iowa .....	Dr. J. C. Dunbary, Sioux City. Dr. C. M. Hobby, Iowa City. Dr. Henry B. Young, Burlington. Dr. W. C. Pipino, Des Moines.	At State Medical Society, 1894.	
Kansas .....	Dr. G. A. Wall, Topeka.		
Kentucky .....	Dr. William Cheatham, Louisville. Dr. S. C. Dabney, Louisville. Dr. J. M. Ray, Louisville.		

Louisiana* .....	Dr. H. D. Bruns, New Orleans.			
Massachusetts .....				
Michigan .....	Dr. Don M. Campbell, Detroit. Dr. F. Carrone, Ann Arbor. Dr. Leartus Connor, Detroit. Dr. J. M. Cook, Muskegon. Dr. Robert W. Gillman, Detroit. Dr. D. M. Greene, Grand Rapids. Dr. J. F. Noyes, Detroit.			
Mississippi .....				
Missouri .....	Dr. Y. E. Murrell, St. Louis.			
Montana .....				
Nebraska .....	Dr. H. Gifford, Omaha. Dr. Isador Gluck, Omaha.			
Nevada .....				
New Hampshire .....				
New Jersey .....	Dr. Walter B. Johnson, Paterson.	At State Medical Society, held June 28, 1894.	Dr. Walter B. Johnson, Paterson, Chairman. Dr. Charles I. Kip, Newark. Dr. P. A. Harris, Paterson.	

\*The law passed the Senate, but was defeated in the House. Will be presented again.

## THE PRESENT CONDITION OF LEGISLATION FOR THE PREVENTION OF BLINDNESS—Continued.

State.	Will Cooperate.	Resolutions Favoring Legislation Adopted.	Committee Appointed.
New Mexico .....			
North Carolina .....	Dr. Richard H. Lewis, Raleigh.	At State Medical Society, 1894.	Dr. A. W. Knox, Raleigh. Dr. Hubert Haywood, Raleigh. Dr. K. P. Battle, Raleigh. Dr. Y. S. Burbank, Washington. Dr. Y. D. Haigh, Fayetteville.
North Dakota .....			
Oregon .....	Dr. S. G. Eaton, Portland.	At State Medical Society, 1894.	
Pennsylvania .....	Dr. J. A. Lippincott, Pittsburg. Dr. G. de Schweinitz, Philadelphia. Dr. P. D. Keyser, Philadelphia. Dr. C. L. Frey, Scranton. Dr. G. M. Gould, Philadelphia. Dr. Charles A. Oliver, Philadelphia. Dr. Charles McIntire, Easton. Dr. G. Oram King, Philadelphia. Dr. John E. Roberts, Philadelphia. Dr. P. N. K. Schwenk, Philadelphia. Dr. Lewis H. Taylor, Wilkes-Barre.	At State Medical Society, held May, 1894.	Dr. J. A. Lippincott, Pittsburg, Chairman of Committee on Legislation.
South Carolina .....	Dr. Chas. W. Kollock, Charleston.		
South Dakota .....			
Tennessee .....	Dr. L. C. Graddy, Nashville. Dr. G. C. Savage, Nashville.		

Texas.....				
Utah .....				
Vermont .....	Dr. J. H. Woodward, Burlington.			
Virginia .....				
Washington .....	Dr. R. L. Thompson, Spokane.			
West Virginia .....	Dr. G. A. Ashman, Wheeling.			
Wisconsin .....				
Wyoming .....				



**Discussion of Paper Read by Dr. W. F. Southard.**

DR. J. T. McLEAN (of Alameda): At the risk of occupying the time of the convention too frequently, I would say that the importance of this subject which Dr. Southard has brought before us cannot be overestimated or overstated. The idea of thousands and thousands of children becoming blind, and totally blind, by reason of the negligence or ignorance of people who are treating those children, or under whose care they have been brought into the world, is really a very alarming and frightful thing, and if this result can be stopped, by all means it ought to be brought about. That is one of the matters that we ought to take in charge and work out—the salvation of the children of the State from this most serious and dreadful affliction of blindness. And so I hope that our State Board of Health will take this matter also into serious consideration, and in regard to this matter formulate some recommendations which shall be printed and spread broadcast through this State. While I am on the floor I want to call attention to another matter in this same connection. I think there is a great deal of work for the State Board of Health to do, and they ought to go about and do it, or else get out of their places and let somebody else take them and go to work. This is plain talk, but it is all in good part, and it is serious, too. I have here in my hand, which I took out of my office to-day, the last three monthly reports of the State Board of Health of the deaths in the State of California. From these three reports I have found that these facts exist: that from communicable, and so preventable, diseases, as Dr. Ruggles states it, which is correct—of this class of diseases there occurred in January in this State, according to this report, three hundred and fifty-eight deaths. In February of this year there occurred three hundred and fifty deaths, and in March four hundred and fifty deaths from preventable diseases. Now, I say these diseases ought to be prevented, and consequently the deaths that have occurred from them; and that it is the business of the State Board of Health to go to work and spread broadcast over the State circulars which shall help the people to information in order to bring about this most beneficent result. I do not say this in any fault-finding spirit; I say it because I am shocked at this statement, that more than one third of the deaths that occurred in the last three months in this State were from preventable diseases. Those diseases ought to be prevented. Whose business is it to prevent them? These gentlemen whom we select and honor with this position, the executive officer of whom we pay a salary to do this very work. Now, I say that if the salary is not enough to induce the State Board of Health to undertake this work, let us give the executive officer who does the work more salary, and let us pay him properly. And just see the executive officer of the Board of Health of the City of San Francisco! There is an immense amount of work for that gentleman, and if he don't get salary enough to do it give him more salary and have it done, and save the lives of the people who are dying in this city from communicable diseases. But to come back to the State Board of Health. That is the point. We can talk about the State Board of Health, because they are our officers. And now, as I say, this data must be correct. It is the publication of our own Board, and it is a most lamentable statement that we get from that, that one third of all the diseases from which all the deaths in the State occur, are communi-

cable, and therefore preventable, diseases. I do not know of any single publication made by our State Board of Health in regard to these preventable diseases, except that in regard to diphtheria. Now, diphtheria is a frightful disease, and a good many people who get it die from it, and it is very appropriate that the Board of Health has made that excellent publication, and whenever I have reported to me a case of diphtheria in our town, which is very seldom, I load myself up right away with several copies of this publication of our State Board of Health, and go and see the diphtheritic family, and I give them a copy of that, and I also give some to neighbors around there. Now, if we were enabled to do this in regard to all other communicable and so preventable diseases, what a world of good we could do, and how simple it is for our State Board of Health to provide us with this sort of literature, which is so necessary for us in doing our work, and I now make a motion, as the end of my statement in this regard, that it is the sense of this State Sanitary Convention that our Board of Health prepare, without unnecessary delay, circulars for widespread distribution over the State concerning all these communicable and so preventable diseases, and supply Boards of Health and health officers everywhere with this sort of literature, in order that they may carry it with them to families that are afflicted with these diseases, and to the neighbors where these diseases exist. I know that a great many medical men who attend these diseases, and the most experienced of them, do not take the pains they ought to take. I know it from my own experience.

DR. BERT ELLIS: I rise to a point of order. This is not pertinent to the subject under discussion.

DR. J. T. McLEAN: I know that physicians do not properly educate the families that they are treating where there are these diseases, and the Health Officer cannot do this always. If an intelligent communication were prepared in regard to each one of these communicable diseases, and given to the Boards of Health and to the communities generally, they would work out a world of good.

DR. M. REGENSBURGER: There is a motion before the house.

THE CHAIRMAN: It has not been seconded.

DR. M. REGENSBURGER: I seconded it.

THE CHAIRMAN: If that motion is to be put, I would request that it be in writing, because the Chair could not catch the drift of the motion. It seems to me the convention is degenerating into rather an attack and defense of Boards of Health, and as I understand it, that will not forward in any way sanitary ideas or the sanitary condition of the people of this State, and the Chair will decide that all this matter and this motion of Dr. McLean are out of order.

DR. M. REGENSBURGER: I think the Chair misunderstands that motion. The motion is a very simple one. There is no censorship regarding the State Board of Health. It is simply a motion that the State Board of Health instruct people regarding communicable diseases and how to prevent them. That is a very simple thing to do. As I understand the doctor, his idea was that a great many people are ignorant regarding communicable diseases. You take ophthalmia in new-born children. Here is a disease that we have all noticed, where the people are ignorant regarding the danger of this disease, and if people were instructed in a matter of that kind they would probably act, and a great deal of trouble would be prevented. As I understand it, that is the object of the

doctor's motion. It is in regard to instruction about some of these diseases, and I think the State Board of Health, which has done the same thing before—they have instructed people in regard to diphtheria and its prevention—should continue the issuance of preventive disease circulars, and there is no reason in the world why this Sanitary Convention should not recommend that the Board notify the people and instruct them in regard to prevention of disease.

THE CHAIRMAN: The Chair will state this: that we have simply gotten away from the subject under discussion, which was a paper by Dr. Southard, and after that is disposed of, the Chair will entertain the motion of Dr. McLean. Is there any further discussion on the subject of Dr. Southard's paper? I hope the gentlemen will confine themselves to remarks on the paper.

DR. M. REGENSBURGER: I move that the paper be referred to the Committee on Publication.

(Carried.)

DR. J. T. McLEAN: I disclaim, in the start, any disposition to reflect upon the State Board of Health. I do not want to attack them. I have no such idea in my thoughts. I am as peaceable as a lamb. I am only positive in regard to a thing that is, from my experience, very necessary and important to be done, and these are the gentlemen to do it; and so I make a motion that the State Board of Health be instructed or requested by this Sanitary Convention to prepare papers upon this subject of purulent ophthalmia, and upon all other subjects relating to communicable diseases, with a view to the spreading of the information which should be contained in their circulars throughout the State for the benefit of the sick.

(Motion seconded.)

DR. J. R. LAINE: Will you kindly enumerate the headings—the different subjects—whether measles, scarlet fever, or what?

DR. J. T. McLEAN: I will read from the State report the diseases that I have classified: Consumption, pneumonia, bronchitis, diarrhoea, dysentery, diphtheria, croup, scarlet fever, measles, whooping-cough, typhoid fever, remittent and intermittent fevers.

DR. J. R. LAINE: I would like to ask if you think there is weight enough in the Board to get through the subject and produce a work that will be commendable and a credit to the State on these various subjects.

DR. J. T. McLEAN: I simply state that the State Boards of Health of a large number of the States of the United States do this very thing; and why our State Board of Health should be behind other State Boards of Health, I don't know. The State should certainly supply them with all the means necessary to publish these reports, and they have the ability to formulate them. If they are not paid enough to do it, let the State give them more pay.

DR. WINSLOW ANDERSON: Mr. President, if I may be permitted to say, this is not a political convention. There seems to be a disposition on the part of some of the speakers, year by year, to find fault with the State Board of Health and to desire to instruct the Board as to its duties and the salaries the State shall pay the Secretary. Now, the organic law creating the Board defines its duties and fixes the appropriations and salaries. The State Board of Health is not under the direction of this convention, nor can it become subservient to resolu-

tions here presented. The members of the State Board are always thankful for any suggestions that might be offered, but they will act according to their own conclusions and established precedents. My worthy friend from Alameda believes that bronchitis and diarrhoea are contagious diseases, and places malarial fevers and pneumonia in the same category with tuberculosis, diphtheria, and scarlet fever. This classification I cannot accept as the opinion of the scientific world of to-day. Bronchitis is most frequently caused by sudden changes in temperature or by "catching cold." It frequently is a sequela of influenza or the result of irritating gases, but not a communicable disease. Ordinary diarrhoea is mostly caused by impure or improper food. Malaria depends upon impure water or impure air, and cannot be classed with diphtheria, which infects from person to person. In regard to sending out circulars, I wish to say that the present Board has sent out five or six upon various subjects. The last one was written by myself and contains simple tests for drinking water. The reports of these sanitary conventions, inaugurated by the present Board, are printed by the State and sent out to every physician and all the boards of health in the State and country. Nothing could have more general circulation than is given by the Board to these reports of our deliberations. All these excellent papers are published, and Alameda shall have one thousand copies if she so desires. I do not see the necessity of preparing voluminous articles on all these diseases, because it is probable that the State Board of Examiners will not have them printed.

DR. M. REGENSBURGER: Now, gentlemen, this is a very important matter. I don't wish to impose any extra duty on the State Board of Health. We cannot force them to do this thing. If they do not wish they need not do it, but there should be a way of instructing the people regarding this very disease of ophthalmia. This is a very important matter, as I see it, and a great many see it every day, and see that the trouble does arise from the ignorance of the people. There is a happy medium to bring this before the public. The State Board of Health does not have to publish any works. If the Secretary of the State Board of Health will formulate a small recommendation and forward it to the different daily papers, they will only be too glad to publish it, and that will be the best way out of it; and I second Dr. McLean's motion to recommend to these gentlemen to take this matter up. I do not wish to prescribe what preventable diseases they should take up, but I would ask that they take up the more important ones.

DR. J. R. LAINE: I wish to state that the duties of the State Board of Health are very clearly stated in the Political Code of the State of California, and among those duties it states that the Secretary, particularly, shall perform such duties as are imposed upon him by the State Board of Health. A great deal of it is discretionary with himself. I believe that the members of the Board understand that I have not shirked much duty. I have done a great deal, and if I have enjoyed a private practice outside of my duties, that is a matter, perhaps, for self-congratulation, the appreciation of my friends, and my good luck. I do not object at all to formulating and causing to be printed (providing the State will print them) circulars on any of these subjects; in fact, I have published some, and the reason that I have not published more was because the publication of one circular on diphtheria would cover perhaps all the needs and requirements in cases, for

instance, of scarlatina. The precautions necessary in the one case are almost sufficient for the other. With reference to smallpox, I do not regard it as necessary to publish one. Still I am willing to concede the point, and I confess, possibly, to a fair amount of ability, sufficient perhaps to write the circulars and cause them to be printed. I had at one time prepared a large amount of matter that I submitted to the Board of Examiners. One of the members was Secretary of State, E. G. Waite, a friend of Dr. McLean. If I remember rightly, he advised it should not be printed. I have sometimes prepared other matter for print and was advised not to have it printed. It was not because it was inexpedient, or that it would be an injury, but it was too expensive. They wanted to confine the printing to the essential necessities. So far as I am personally concerned, I believe in the kind of circulars that Dr. McLean speaks of. I have prepared a number, five or six, I think, but have not extended them for the reasons given. I do not think it is because I am lazy. I am willing to make all those recommendations officially, and hope they will be accepted.

(The Chairman put the motion of Dr. McLean, which was carried unanimously.)

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### THE CHECK-REIN; ITS USES AND ABUSES.

By CEPHAS L. BARD, M.D., of Ventura, California.

The check-rein now commonly in use, at least that form known as the side check-rein, originated many centuries before the era which we regard as that of a Christian civilization, boastful of its accomplishments for the amelioration of the condition of mankind, and of its humane and merciful treatment of its beasts of burden. It is shown without a doubt, by reference to the ancient Egyptian monuments, that the chariots of Pharaoh's time were drawn by horses furnished with check-reins attached to the pad, just as they are to-day. We have in the Scriptures, also, inferential mention made of its use. Thus in Job, thirtieth chapter, second verse, appears the following: "They have also let loose the bridle before me."

The persistence in such a custom can only be explained by attributing it to the belief, on the part of many, that the use of the device in some form, if not indispensable, is at least desirable. For, in spite of the able, intelligent, and forcible arguments and appeals of humane people organized into societies for the special purpose of preventing cruelty to animals, and who favor the absolute disuse of the check-rein, as set forth in tracts and other literature scattered gratuitously broadcast o'er the land, it is absolutely true that public opinion has not conceded to these reformers that the check-rein is destitute of all merit, and resists the ultra prohibitive measures which they advocate.

Never since his subjugation has so much been done for the alleviation of the horse's condition of servitude as now. Never has he been exposed to such a close scrutiny and critical study as he is in these times, when, with an ever-increasing lowered record, he exacts more homage from fair lady and brave man than did the knights of old. As he speeds along the crowded track, the shadow of his stride is caught on the artist's plate; the pen of the bard immortalizes him in verse; and the

brush of the painter and the chisel of the sculptor perpetuate his wonderful pace. To preserve and improve his blood, efforts are made rivaling those of royalty; his stall is fit for the nursery of a prince, and the care of his body is an art in itself.

All the absurdities of fashion pertaining to his appearance and dress have been abolished. His mane is no longer hogged, nor his ears cropped, nor his tail nicked or docked. Unnecessary trappings and superfluous appendages have been removed from his attire. Blinkers have been cut down or discarded; shoes have been reduced in weight; but wherever seen, as Dobbin jogging along the country road, as the well-groomed high-stepper parading in the park, or as the victor of a well-contested heat, there you will observe the long-used, much-abused check-rein surmounting the flowing mane.

Let us inquire as to the cause of the persistence of the custom and ascertain to what extent the claims of its advocates are tenable. It is asserted that, provided with the check-rein, horses appear more stylish and are prevented from acquiring a drooping head and logy gait; that driving is rendered more pleasant to the driver who is not obliged to hold up the horse's head with the driving lines; that fouling of the lines is less apt to occur; that it assists the driver in controlling a runaway; and that it prevents the animal from stumbling.

For our purpose, a consideration of the construction of the several forms of the device is necessary. Ignoring the Bedouin, gag, and others, cruel complex systems of extra bits, pulleys and levers, we have but two in ordinary use, the "side" and the "overdraw." The former is so familiar an object that it hardly requires a description. The objections to its use are that it is not so neat in appearance as the other; that it wears the mane; and that it is apt to disturb the position of the bridle. When a horse provided with this form lowers his head, the device, especially if tightly applied, becomes a lever of the second kind; the head being the power, the hook the fulcrum, and the side-loop through which it passes, the weight. With every descent of the head, traction is made on the loop, and through it on the brow-band, which is brought in contact with the ears. These organs being covered with skin thinner and more delicate than is found elsewhere, are almost as sensitive as his mouth, and such friction inflicts pain and provokes irritation. Anything which interferes with the normal play of the mobile ears is objectionable. It is a matter of observation that horses difficult to bridle are generally those furnished with this antique form which has been handed down from the shadow of the Pyramids. An interspace exists between the head and the atlas, and concussion and compression of the spinal cord is easily effected by a blow or pressure. A stroke on this sensitive spot will quickly fell a horse. Pressure of a rope passing through the mouth and over the poll was a favorite method of subjection resorted to when infliction of pain was regarded a *sine qua non* in horse-training. A bullet from the plainsman's rifle, by simply creasing the neck, has stunned and made captive many a lord of the plains. The pressure of the crown-piece of the bridle on the poll, caused by the leverage of the side check-rein, is an additional objection to its use.

The "overdraw" is of comparatively recent origin, and its introduction met with considerable opposition, but it has steadily come into favor, and with horsemen generally has secured the preference. Its construction is such that whilst connected with the bit it is not attached

in any way to the bridle, and consequently cannot disturb its position. It must not be confounded with the "Kemble-Jackson," which is attached to an extra small bit in the mouth, and which, especially when adjusted too tightly, is a constant source of uneasiness and suffering.

Understanding the construction and application of the two forms of check-rein, we are now prepared to discuss the claims of those who regard it as a device of utility and of necessity to their horses and themselves. It may be conceded that its use does impart a more stylish appearance to the horse and prevents him from acquiring a logy gait. Very often, however, and especially by the use of the "overdraw," his head is held up higher than his Creator intended, and subjected to a constrained position for hours, the degree of torture corresponding to the shortness of the check-rein. Even when halted, he often experiences no relief, owing to the neglect of his driver, who is either too careless or ignorant as to the humanity of unchecking him. Observe the inconsistency of the Christian owner, who kneels in shaded pew to ask his Maker to be merciful to him, whilst his horse stands outside staring with glazy eyes at the noonday sun!

The side check-rein, when adjusted too tightly, draws the head towards the chest and distorts the windpipe. This is conducive to roaring and other affections of the air passage. By interfering with the return of the venous blood from the head, it predisposes to megrims, apoplexy, and other cerebral diseases. The provision for the return of the blood to the heart from the head is not well provided for in the horse. Owing to his pendent head, gravity does not assist materially, as in man, the flow of blood towards the central organ of the circulation. It is said by veterinarians that poll-evil is most often found in horses belonging to those who resort to this cruel perversion of the side check-rein.

Continuing our subject, we will admit that the use of the device renders driving more agreeable to the driver, as he is not obliged to hold up the horse's head by means of the driving lines, and that with its use fouling of the lines is less apt to occur. But our admissions now cease. We fail to see that its presence materially assists a driver in restraining a runaway, for by no means can any traction be made on it. It may possibly aid in controlling a kicking horse, as he cannot well display his propensity when his head is uplifted. We emphatically deny that its use in any manner prevents stumbling. Dickens, in "Pickwick Papers," makes his cabman say: "He always falls down when he's took out o' the cab, but when he's in it, we bears him up werry tight and takes him in werry short, so as he can't werry well fall down." This seems to reflect the general impression, and yet no greater absurdity in the way of argument was ever paraded. The horse's head, by means of a tight check-rein and back-strap, is really fastened to his tail, and instead of preventing it favors stumbling, as the horse, in falling, has no chance to recover himself. As it is, the check-rein or pad-hook is usually broken by the efforts of the animal to regain his footing. Shakespeare, whose knowledge of horsemanship was astounding, was aware of this, and thus alludes to it in "The Taming of the Shrew," Act 3, Scene 2: "And with a half-checked bit and a head-stall of sheep's leather, which being restrained to keep him from stumbling, hath been often burst and now repaired with knots."

The use of the check-rein is harmful in other ways. In heavy draught it causes a large portion of the horse's power to be lost, from

the animal being unable to lower his head so as to throw more weight on the collar. The drayman alive to the importance of the conservation of his animal's strength will discard it, and the driver of a lighter span should uncheck before ascending a heavy grade. Again, its use frequently precludes the possibility of the horse procuring a much needed drink. Drivers, especially if not owners, will cross streams and pass by watering-troughs without giving him a drink, simply on account of their disinclination to alight and uncheck for the purpose.

The object of this paper is to present a plea for the more humane application of the check-rein, the granting of which, the author believes, is not to be attained by a continuation of a long, bitter crusade, but by acceding to it some merit and utility, as its common usage would imply, and by instructing the public in regard to it. *The check-rein can be intelligently and humanely applied.* Loosely adjusted, so that the head and neck will correspond to the position spontaneously assumed in the paddock, it cannot be detrimental, especially if loosened when halted or ascending hills. Under certain conditions its application is of positive benefit to the horse. The head of the animal is supported mainly by the ligamentum nuchæ, which springs from the occipital bone and is attached to the spinous processes of the spinal vertebra. This ligament differs from the others of the equine body in being elastic. It increases in length two inches when the horse is grazing or drinking from a shallow stream, and resumes its normal dimensions when the head is raised aloft. Although the head is so suspended, it is elevated by powerful muscles. On long journeys, when the animal has been permitted to jog along with loosened rein, it becomes an effort for him to raise his head, and his position is as much constrained as if it were held up by the check-rein for the same length of time. If, now, the check-rein be attached to its hook he is furnished with positive comfort and relief, the rein being an auxiliary to the ligamentum nuchæ, and aiding and supporting the weary muscles of the neck. This assertion is supported by the experience of both the rider and driver. The vaquero, or cowboy, knows full well that his exhausted steed is supported and steadied by a tightened rein.

An additional corroboration is based upon the experiment of M. Baucher, a French scientist, who devoted much attention to the study of the horse. He placed a mare with her fore and hind legs on separate weighing machines, and found that when left to assume her own attitude, she weighed on the fore scales 210 kilogrammes, while her hindquarters drew only 174, her total weight being 384 kilogrammes, each of which is equal to 2 pounds, 2 ounces, 4 drachms, and 16 grains avoirdupois. By depressing the head so as to bring her nose to a level with the chest, 8 kilogrammes were added to the front scales, while the raising of that part to the height of the withers transferred 10 kilogrammes to the rear scales. Again, by raising and drawing back the head in a way similar to the action of the check-rein, 8 kilogrammes were transferred from the fore to the hind scales.

The forward projection of the head and neck causes the greater portion of the equine weight to be borne by the fore legs. This is especially so in trotting, and it would be advantageous to so alter his carriage at intervals as to make his hind legs carry more than their share of weight. "Stonehenge" says: "Except in the gallop and canter, the fast trot and in leaping, the weight of the horse is borne



by two or more of his legs, and we shall find that in consequence of the projecting forward of the head and neck, the larger moiety is sustained by the fore leg (or legs) than by the hind. It is important to the horse-master to ascertain the circumstances which will change these proportions, because he finds practically that in road work the fore legs wear out faster than the hind, and consequently any means by which the weight on them can be reduced will be a gain to him in a pecuniary point of view. Every practiced horseman knows that his horse's fore legs will suffer in proportion to the weight which is thrown on them, while their relief is an additional source of strain to the hind legs. The spavined and more especially the curby-hocked horse relieves these parts by using his fore legs to carry more than their proper proportion of weight, while the animal affected with any painful disease of the fore limbs carries almost all the weight of his body on his hind legs, which are advanced under him in the most peculiar manner. The value of artificially changing the natural carriage of the horse, so as to make his hind legs come forward and carry more than their own share of weight, is chiefly felt in chargers, hack and harness horses, while on the contrary, it is injurious to the hunter and race horse, whose hind-quarters bear the greatest strain."

What "Stonehenge" has suggested is accomplished by repeating the experiment of Baucher. By tightening and loosening the check-rein we can shift from ten to twenty pounds from the fore to the hind quarters, and back again at will. The importance of this on long journeys cannot be overestimated.

Some original study of that form of locomotion designated as the *trot*, which has been recorded elsewhere,\* has a direct bearing upon the subject under discussion. In the horse it is an acquired gait, which has required years to perfect. Forced to this gait, which before his subjugation was unknown, he cannot display the speed which he does in the *natural* one of running. Being an unnatural gait, the trotter breaks down quicker than the racer. In the evolution of the trotting horse it has been found useful, in order to develop his greatest speed, to raise his head and effect its extension. The lowering of the trotting record, which had practically remained unchanged for years, is coincident with the introduction of the much-abused over-draw check-rein, which, by placing the head in an elevated, extended position, not only changes his center of gravity, but furnishes the animal with a straight, unobstructed air passage. Indispensable in a burst of speed on the track, when it is desired to make the fastest time, it is, with the same amount of tightening in ordinary driving, an instrument of torture, which should be loosened by the heavy hand of the law. In the slow trot or jog, where there is no pressing demand for a prompt, unimpeded supply of oxygen, such a degree of extension is extremely cruel and barbarous. In the *fast trot*, however, owing to the more rapid tissue change and urgent need for an unstinted amount of air, it is absolutely essential. I assume the position that if the trot of the horse, especially the fast trot, were a *natural*, instead of an *acquired*, gait, he would be supplied by nature with some method of securing the position of an elevated, extended head, which furnishes him with an unembarrassed respiration, and develops the greatest perfection of this particular form of locomotion.

\* Extension of the head during anæsthesia.

My assumption is strengthened by the evidence furnished by the reindeer, which is the only natural fast trotter found in nature. The trot of this animal displays a poetry of motion which the horse, in spite of his education, can never be expected to attain. Splint, spavin, windgalls, sprung knees, and stiffened shoulders, which sooner or later mar the symmetry of the limbs of the equine trotter, and which sooner or later consign him to the paddock, are never seen in this servitor of Arctic man. Statements of its speed and endurance are almost incredible. Journeys of one hundred and fifty miles in nineteen hours are said to be common. One is said to have drawn an officer, bearing important dispatches, in 1669, eight hundred English miles in forty-eight hours, and the portrait of the poor deer, which fell dead at the end of the marvelous journey, is still preserved in the Palace of Drottningholm, in Sweden. Of the fifty-two species of Cervidæ, the reindeer is the only one of which the female is provided with antlers. It is not a pugnacious animal, and when exposed to danger invariably resorts to flight. In rapid motion it elevates its head, and the antlers, resting horizontally backwards, produce marked extension of the head and steady its upturned nose. This attitude provides a straight, undeviating passage for the entrance of air to the lungs. By their weight and traction, the antlers, especially in long-continued flight, reinforce the strained ligamentum nuchæ and the weary muscles of the neck. In other words, the antlers are nature's over-draw check-rein, the prototype of the much-abused modern one, which cannot be loosened at will, but which, as we have seen, is useful in developing speed in the horse when driven to a gait which is acquired, but which in the fleetier reindeer is natural. A convincing argument in favor of this view is presented by a feature connected with shedding of the antlers. Formed in the early spring, they are dropped by both sexes in November. If at that time the doe should be pregnant, she retains her antlers until she brings forth her fawn, which event may not occur until the following spring. This is apparently a wonderful provision of nature, by which she is permitted to retain appurtenances useful in flight, so that when in peril they may contribute to the preservation of what Leigh Hunt, in speaking of the gravid woman, designates as "the living treasure containing treasure about to live." Considering that these antlers are developed in very early life, much earlier than in the other species; that both sexes are supplied with them; that, at least as far as I can ascertain, they are less exposed to danger and incapable of manifesting their greatest speed during that portion of the year when they are dehorned; it would appear that nature has displayed a wonderful partiality for the preservation and perpetuation of this particular species, without which the boreal regions of both hemispheres would be uninhabitable.

In concluding this paper, the author hopes that the same spirit which prompted him to present a subject which may seem of minor importance as compared with others more intimately connected with the welfare of the State, may cause others to interest themselves in this matter of humanity concerning God's noblest gift to man. No one is in such close communion with the horse as the physician, especially if he is practicing in a rural district. No one has more power in his immediate vicinity, or exerts more influence for good or evil. Let him teach his patients that while the check-rein, under certain conditions, is a device

of utility, it is capable of doing much harm. Teach them that the objections to it are not so much in its use as in its abuse. Set them an example by applying it intelligently and humanely. Appeal to the common sense of those who pervert its use, and wound the pride of those who mercilessly make star-gazers of their animals. Impress upon them the importance of a loose rein in ascending hills, and of taking advantage of the value of unchecking their horses when tired, and of checking them after miles have been traveled with a drooping head. Invoke the law to release the device when the horse is tied, as he often is, for hours in front of business houses, churches, and places of amusement. In some cities of our Union municipal ordinances exist, compelling owners to uncheck their animals when halted for any length of time. Each one of us in our respective communities can do much to generalize this humane practice. This Assembly can well afford to vary its efforts for the good of man by calling attention to the legitimate use of the check-rein, and asking for legislative aid to correct its abuses.

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#### IMPORTANT FACTS AND PRACTICAL DIFFICULTIES ENCOUNTERED IN ENFORCING SANITATION.

By G. W. DAVIS, M.D.

As we retrospect the last twenty years of medical history, we find nothing that has increased in interest more certainly and forcibly than the important and benevolent fact that the future of medicine is to be very largely in the field of sanitation.

The student who has kept in constant touch with the prodigious progress of the times, has seen precept and theory, one after another, fall before the indefatigable research of the pathologist and bacteriologist, however much the accuracy of the latter may be questioned, as it is at the present time.

Our revered medical teachers taught us many things which have since disappeared like the baseless fabric of a vision; and instead there has arisen a new era, new methods of treatment, not only in internal medicine and surgery, but also in the rapidly expansive field of preventive medicine.

The arduous and unselfish labor that is being bestowed in this life-saving department of a lofty and scientific profession must forever remain to, and be considered by, the future medical historian as highly praiseworthy and monumental.

It is in the memory of, perhaps, all of us, that it is not more than, possibly, ten years since scientific research imparted to the profession any actual or even satisfactory idea of the immediate cause of those diseases known as infectious. Their contagiousness was disbelieved by many; physicians having an extensive experience with this class of diseases had observed their special incidence in particular localities, yet more in certain dwellings, still the causes were, by many, presumed to be entirely due to unsanitary conditions.

The decomposed animal and vegetable matter in basements, sewers, and low, damp places, was supposed to be almost the only causative influence. To-day, such unsanitary environments are promptly acknowl-

edged to exert an influence favorable to the production of such affections; but experienced observers of zymotic diseases give such influences a secondary place, and consider them as exciting causes rather than the immediate cause.

The important fact just here is, in my judgment, that the damage which the presence of decomposing organic matter produces in the cause and propagation of such diseases should not be lightly treated or lost sight of. Otherwise, the laborious sanitarian and the efficient health officer will frequently be deprived of an argument and power of exceeding value in disseminating knowledge of sanitation, or sanitary measures, and the suppression of outbreaks of contagious diseases, or to supply a reasonable or satisfactory explanation of the existence of sporadic cases.

Thus briefly disposing of the importance of decomposing material, or products, in favoring the occurrence of infection, there is another important fact deserving attention, and it is what is known as the immediate cause of diseases due to bacteria, or the products of their metabolism.

Take, for example, diphtheria, which is more constantly present either endemically or sporadically, and more frequently possesses greater virulence, than any of the other infectious maladies.

The important fact in connection with this terrible disease is that its prevention, if not ultimate annihilation, will be preëminently due to the conscientious sanitarian and health officer; but these, however conscientious and efficient, cannot possibly succeed without the intelligent coöperation of the entire medical profession. Upon the individual physician rests the responsibility to correctly diagnose diphtheritic cases, and promptly report them to the proper officials.

The fact of the inability of some to immediately recognize acute infectious diseases is, unfortunately, one of the first and important practical difficulties in dealing with such cases and enforcing sanitative measures.

Several years after Löffler discovered the bacillus which he asserted to be the cause of diphtheria, investigators in many laboratories asserted, with equal earnestness, that this bacillus is present in many cases of diphtheria, yet claiming that in other cases it is not necessary to the production of the diphtheritic exudate.

At this time there are men prominent in the medical profession who do not accept the microbic theory of disease.

When we remember that with the most skillful it is difficult in many cases to clinically differentiate diphtheria from other acute affections of the upper air passages, that it does not in all cases produce an exudate, that an exudate does not always signify diphtheria, we think we can be clearly understood, when we state at this point, that an important fact becomes peculiarly accentuated, that the physician should use every clinical means within his reach to thoroughly familiarize himself with the subjective and objective symptoms of all acutely infectious diseases, and not, as is being strenuously urged, depend entirely upon microscopic examination for a positive confirmation of diagnosis.

The bacilli coli (which are found constantly in greater or less numbers in the large bowel) are believed by a few to be essentially the same as the typhoid fever germ, and to develop a like pathogenic characteristic when the condition is favorable.

In fact, it is freely urged that the diphtheria bacilli are discovered

among a very large number of microbes occupying apparently healthy mouths.

It has been recently stated by a well-known clinician that it is "absolutely certain there are two forms of diphtheria, which present to the eye similar changes in the mucous membrane, and both are characterized by the appearance of a pseudo membrane, at times dirty white and again yellow-white in color. Viewed at the bedside, we will find in both a like prostration, a febrile condition, swelling of the sub-maxillary glands, and disturbance of respiration. The exudate of one will reveal nests of bacilli which are found in true diphtheria, while in the other there are no bacilli, but instead the so-called staphylo and streptococci. The first variety is highly fatal, while the second, so far as the danger to life is concerned, is comparatively harmless."

With regard to the latter statement, another exceedingly clever authority says: "This is wrong, for even these causes may," and I add do, "produce fatal blood-poisoning if not prevented by proper treatment."

In these two forms of the disease, though the one is true and the other false, the tendency, however, of both is to fatality. Therefore, only a clear knowledge of the symptoms of these forms can reveal their real character, and thus possibly avert the spread of either or both forms of infection.

In a recent circular sent to all the United States Marine Hospital stations by the Surgeon-General of the Marine Hospital Service, it is stated: "In a majority of cases a bacteriologic examination is necessary to determine the character of the disease, requiring from twelve to eighteen hours to make proper cultures." And again, "If the case is one of diphtheria, cultures should be taken every five or six days after disappearance of the membrane." This is to determine when the bacillus diphtheria disappears. In a well-appointed army or navy medical service, or in cities where there are specialists in bacteriology, where laboratories are accessible to, and where the physicians generally are more familiar with the microscopic technique, this can and should be done.

In the country or in smaller towns, where an epidemic of diphtheria frequently has its origin, the use of this means is, in a large majority of cases, impossible, and in this important fact lies another of the practical difficulties in dealing with, and enforcing sanitation in this class of infectious troubles. An observing physician's eyes, keener and surer than a microscopic lens, sees and knows a pathologic lesion as well as perversion of function.

The problem of railway-train, street-car, and workshop sanitation will now, though briefly, claim our attention. Indeed, the characteristics regarding sanitation in these directions are so complex and difficult, involving, as they do, so many mechanical questions, that we cannot do more, in a paper of this kind, than mention the important fact that the first principle involved in passenger-coach, street-car, and workshop sanitation is absolute cleanliness. If, through this convention, an additional or profounder impression can be made upon those who should, from a humanitarian point of view, properly provide the best possible means for the safety and health of those who are, or may become, patrons or employes, it can be said, not boastingly, but because we respect the welfare of our fellowmen, our meeting will not have been in vain. If the prime necessity of the first principles can be inculcated, it will not be long, through the wonderful inventive powers for which the

American people are so well known, before the scientific and highest sanitary method of heating, and ventilating, and lighting all vehicles used in public transportation will have been reached, and another of the many practical difficulties of enforcing sanitation removed. In my judgment, the question of how to heat, light, and ventilate a car must be the collective result of the sanitarian, architect, and mechanic.

Finally, we come to consider the importance of sanitary legislation. The experience of many able in the line of sanitary work has been peculiar, if not often exasperating, in their endeavors to have legislators enact even a modicum of sanitary measures or laws. Beginning with a condition of almost absolute sanitary chaos, as regards legal sanitary measures, laborers in the field of preventive medicine are beginning to reap the reward of their indefatigable perseverance and industry. There exist in the minds of the profession and legislators diametrically opposing views as to which is the wisest thing to do: to first enact sanitary laws, or begin with the education of the masses.

I agree with those who believe that we should begin at the highest notch in the scale. Sanitary ideas, like all advanced ideas, must begin high up and move downward. Law, as a rule, is the most effectual educator. I would not be understood by this that we should urge a great number of statutory enactments, but only such as contain the basic principles of sanitation, wholesome, clearly understood, and that will effectually enable boards of health of State, county, and city, and health officers, to obviate many of the existing practical difficulties in enforcing sanitation.

When this foundation stone of the sanitary structure has been well laid, then we can proceed more rapidly to educate the public. The ignorance of the masses as to the importance of sanitation is one of the difficulties encountered in enforcing it, and not, I think, as had been thought, due to stubbornness or maliciousness.

In concluding, is it too much to claim that the labor of this convention, of the individuals who have taken part, and of each in his own locality, may all be no insignificant factors in the realization of that highest sanitary destiny to which we are, I trust, surely and gladly hastening?

## ADULTERATION OF FOOD AND DRUGS.

The following chapter of the Statutes enacted by the last Legislature is so important, as well as beneficent, that it is deemed best, in the interest of public health, to give it as wide publication as possible. It is not generally known that the Act included a penalty for the sale of milk from a diseased animal, but Section 3 (b), (5) explains that the sale of such milk makes the person guilty of a misdemeanor, and liable to a fine not exceeding one hundred nor less than twenty-five dollars, or imprisonment in the county jail not exceeding one hundred nor less than thirty days, or both. Milk from cows afflicted with tuberculosis or any other disease, comes under this statute:

### CHAPTER LXXVI.

#### *An Act to Provide Against the Adulteration of Food and Drugs.*

[Approved March 26, 1895.]

*The People of the State of California, represented in Senate and Assembly, do enact as follows:*

SECTION 1. No person shall, within this State, manufacture for sale, offer for sale, or sell any drug or article of food which is adulterated within the meaning of this Act.

SEC. 2. The term "drug," as used in this Act, shall include all medicines for internal or external use, antiseptics, disinfectants, and cosmetics. The term "food," as used herein, shall include all articles used for food or drink by man, whether simple, mixed, or compound.

SEC. 3. Any article shall be deemed to be adulterated within the meaning of this Act:

(a) In the case of drugs: (1) If, when sold under or by a name recognized in the United States Pharmacopœia, it differs from the standard of strength, quality, or purity laid down therein. (2) If, when sold under or by a name not recognized in the United States Pharmacopœia, but which is found in some other pharmacopœia or other standard work on materia medica, it differs materially from the standard of strength, quality, or purity laid down in such work. (3) If its strength, quality, or purity falls below the professed standard under which it is sold.

(b) In the case of food: (1) If any substance or substances have been mixed with it, so as to lower or depreciate, or injuriously affect its quality, strength, or purity. (2) If any inferior or cheaper substance or substances have been substituted wholly or in part for it. (3) If any valuable or necessary constituent or ingredient has been wholly or in part abstracted from it. (4) If it is an imitation of, or is sold under the name of, another article. (5) If it consists wholly, or in part, of a diseased, decomposed, putrid, infected, tainted, or rotten animal or vegetable substance or article, whether manufactured or not; or in the case of milk, if it is the produce of a diseased animal. (6) If it is colored, coated, polished, or powdered, whereby damage or inferiority is concealed, or if by any means it is made to appear better or of greater value than it really is. (7) If it contains any added substance or ingredient which is poisonous or injurious to health. *Provided*, that the provisions of this Act shall not apply to mixtures or compounds recognized as ordinary articles or ingredients of articles of food, if each and every package sold or offered for sale be distinctly labeled as mixtures or compounds, with the name and per cent of each ingredient therein, and are not injurious to health.

SEC. 4. Every person manufacturing, exposing, or offering for sale, or delivering to a purchaser, any drug or article of food included in the provisions of this Act, shall furnish to any person interested, or demanding the same, who shall apply to him for the purpose, and shall tender him the value of the same, a sample sufficient for analysis of any such drug or article of food which is in his possession.

SEC. 5. Whoever refuses to comply, upon demand, with the requirements of section four, and whoever violates any of the provisions of this Act, shall be guilty of a misdemeanor, and shall be fined not exceeding one hundred nor less than twenty-five dollars, or imprisoned in the county jail not exceeding one hundred nor less than thirty days, or both. And any person found guilty of manufacturing, offering for sale, or selling, an adulterated article of food or drug, under the provisions of this Act shall be adjudged to pay, in addition to the penalties hereinbefore provided for, all the necessary costs and expenses incurred in inspecting and analyzing such adulterated articles of which said person may have been found guilty of manufacturing, selling, or offering for sale.

SEC. 6. This Act shall be in force and take effect from and after its passage.





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